

# Chemical Age

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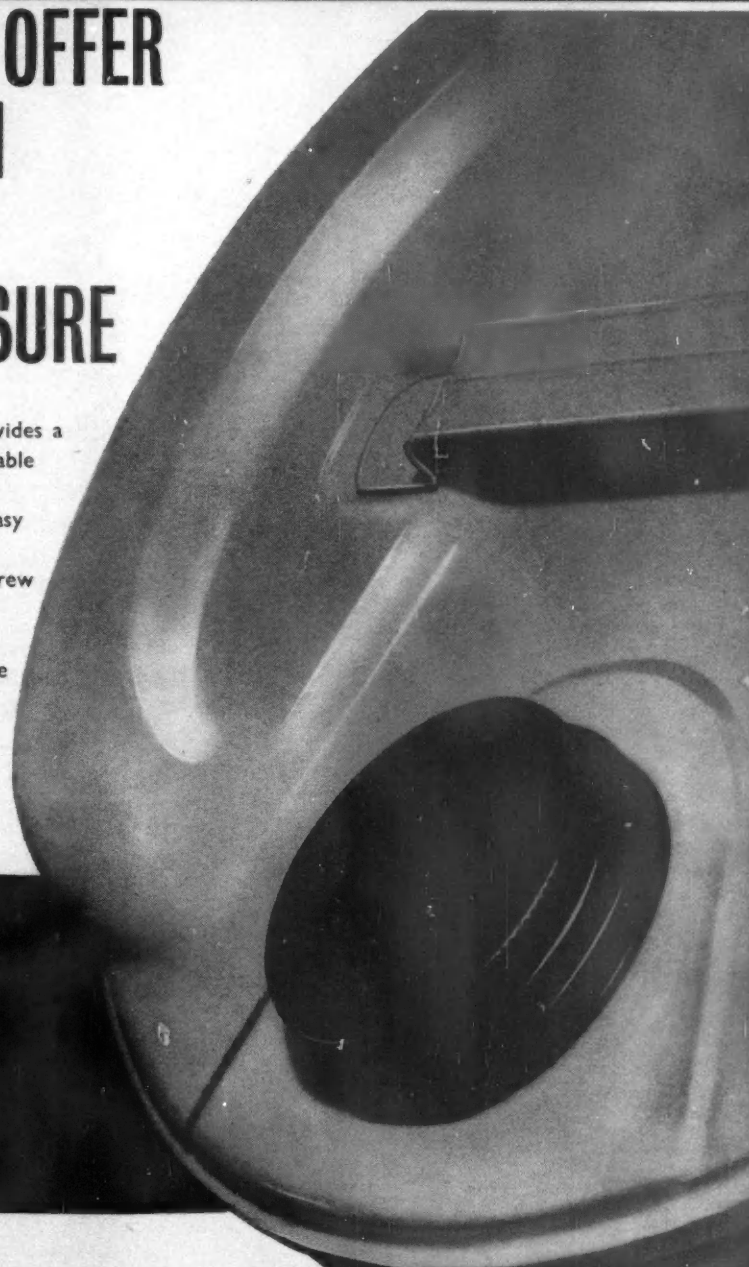
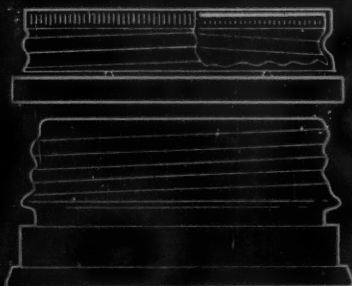
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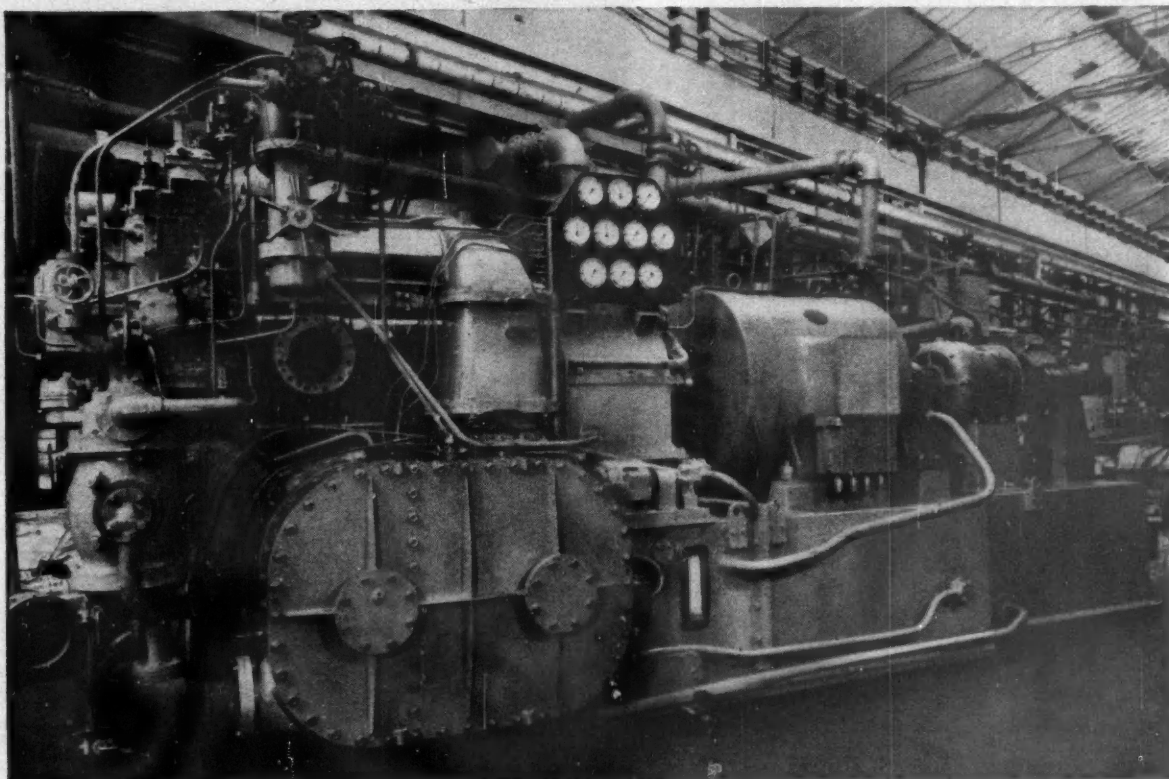
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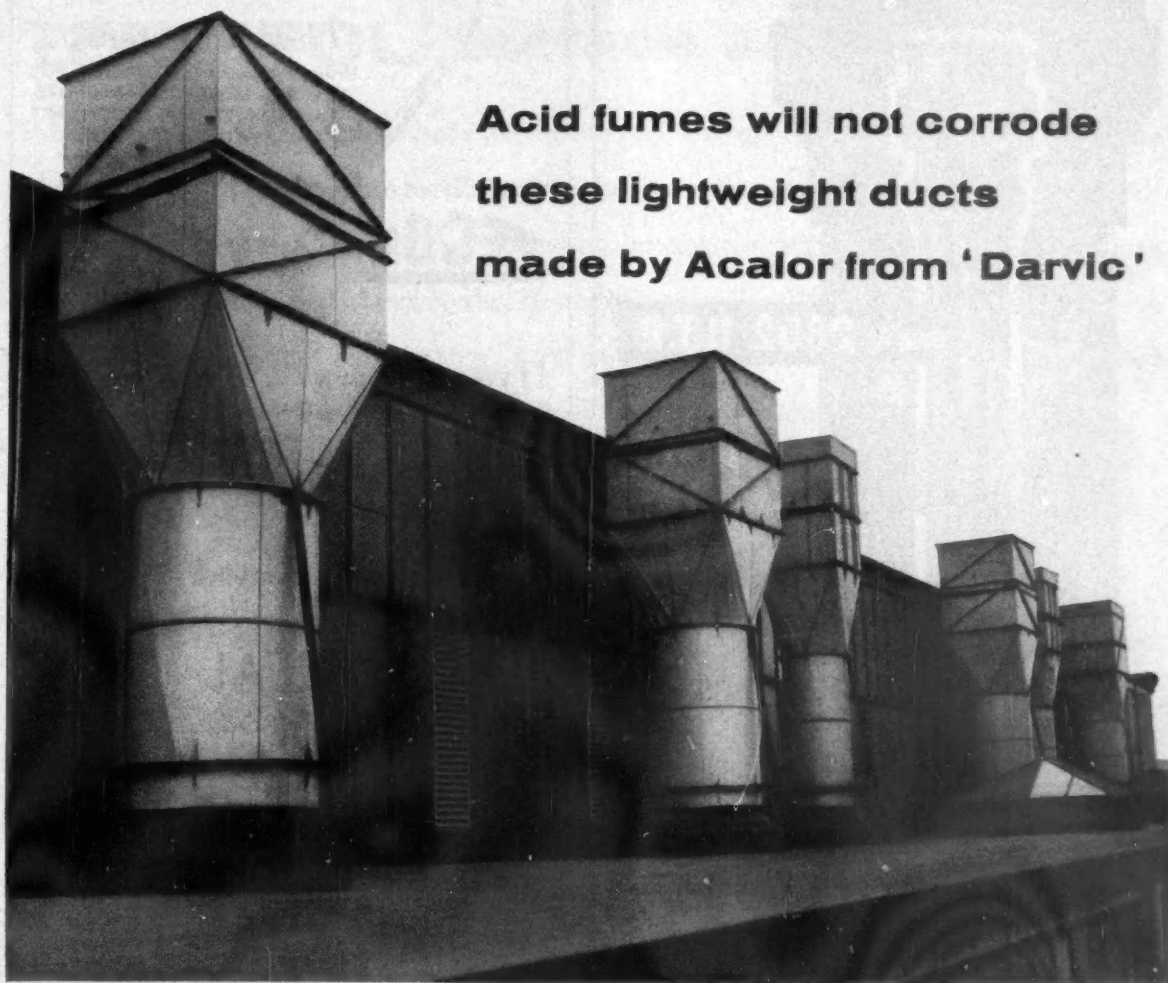
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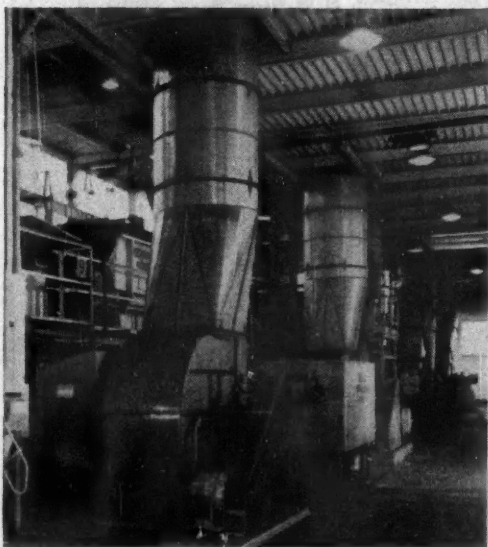
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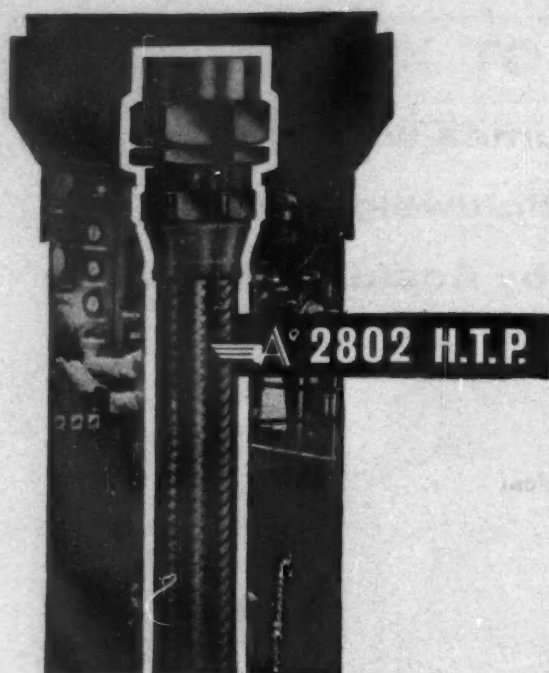
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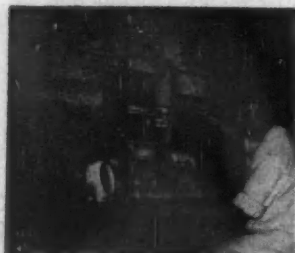
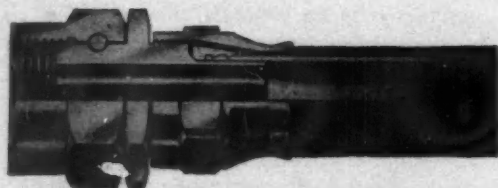
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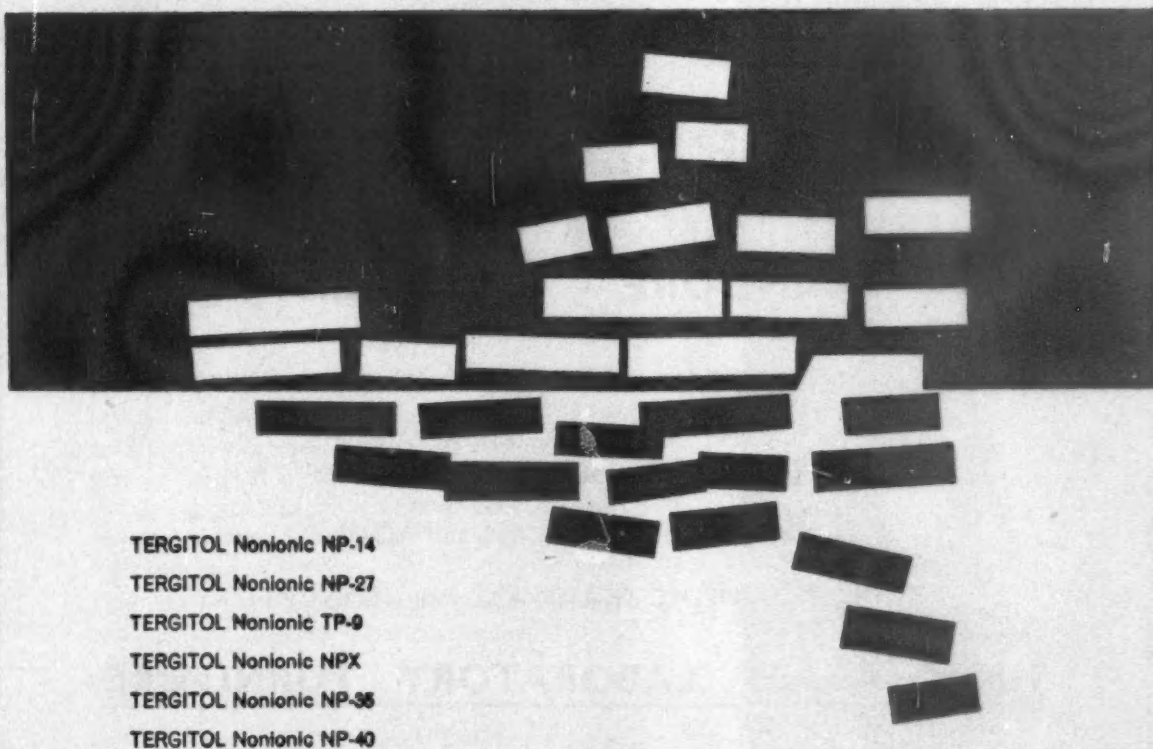
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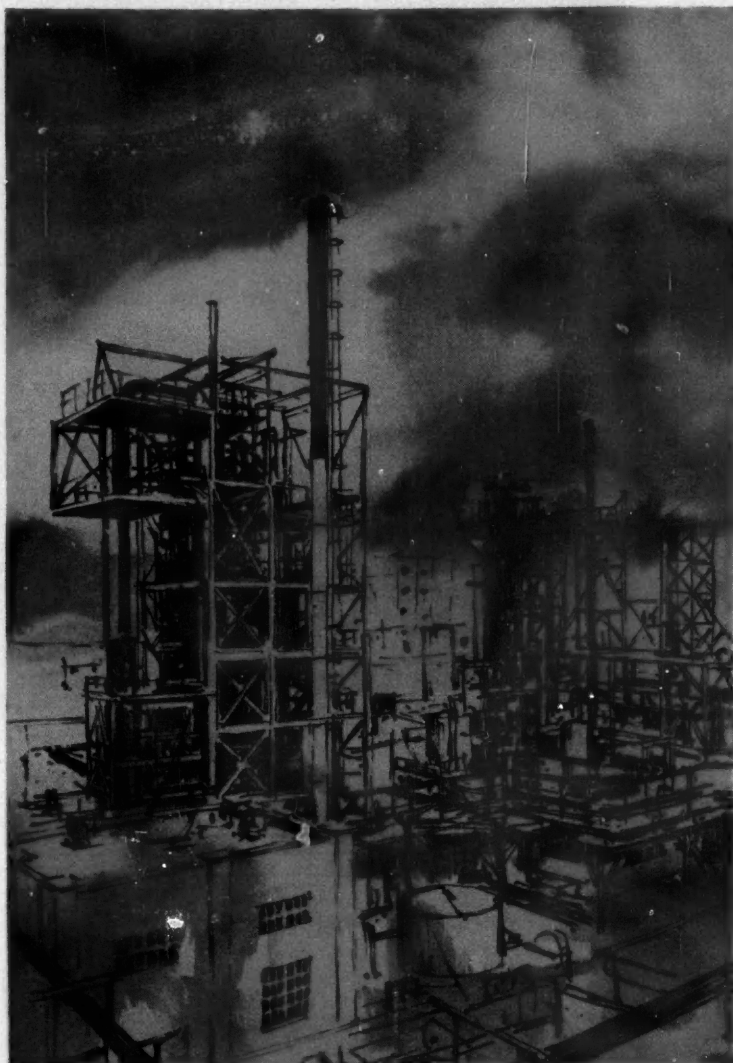
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# Chemical Age

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## CHEMICALS AND G.A.T.T.

**A**LTHOUGH the British and U.S. Governments appear to be in agreement about the need for a 20% 'across-the-board' cut in tariffs under the Geneva Agreement on Tariffs and Trade, the same can hardly be said of the chemical industries of the two countries. In fact, there is not a chemical industry in Europe that would favour such a cut under present circumstances.

The reason for European opposition to this present U.S. approach is not hard to seek. A 20% general cut on tariffs within Europe would lower duties that were already as low as in any industrial area of the world. As far as U.S. tariffs on chemicals are concerned it would generally only mean taking one brick off an already extremely high tariff wall. The U.S. duty on organics produced either from coal tar or petroleum, for instance, varies from 100% to 120%, compared with 33½% in the U.K., while for the much debated polythene, the U.S. duty of around 45% *ad valorem* compares with a U.K. rate of 10% and a proposed Common Market duty of just over 20%.

The U.S. Administration and chemical industry have in the round of tariff negotiations that started early last year in Europe succeeded only in antagonising European interests. U.S. negotiators have excluded from the list of goods on which they have been prepared to discuss tariff cuts all those chemicals which have the biggest export potential so far as Europe is concerned.

The French and German chemical industries are already putting pressure on their Governments in the hope that the Common Market authorities will go slow on the proposed 20% G.A.T.T. cut. Unless the U.S. is prepared to reciprocate, organic chemicals will be excluded from the discussions.

The attitude of the U.S. Synthetic Organic Chemical Manufacturers' Association was put recently by Dr. C. K. Black of du Pont, who said this was a key industry essential to national security. His view that World War I experience would be repeated if, under a liberal trade policy, foreign nations became the sole or principal source of essential chemical products is a supreme red-herring.

Dr. Black listed a number of principles which the industry should support. These included negotiations on a product-by-product basis and a tariff that compensated for the difference between the invoice value of a foreign product and the U.S. market price. In determining the competitiveness of a foreign product, Dr. Black wants its function as well as its chemical structure to be taken into account.

This attitude of the world's largest chemical producing country is difficult to appreciate. U.S. producers who have already dragged European prices down by dumping, want further concessions in Europe, while at the same time fighting tooth and nail against reductions in their own tariff structure, which is so ludicrously high that foreign competition is virtually excluded.

We believe that the world's chemical industry can best operate in a climate of complete free trade. Such conditions are clearly impossible without a radical change of attitude on the part of America. The U.S. Administration, which has been the bastion of freedom for so many years, should by now have learned that its industries cannot hope to sell in Europe other than on equal terms.

## Italian polythene imports lead to anti-dumping request

FOLLOWING the announcement that the Board of Trade were considering an application for an anti-dumping duty against polythene imported from the U.S. (CHEMICAL AGE, 2 December, p. 879) it is now stated that the original application has been extended to cover imports from Italy.

Representations should be submitted in writing not later than 22 December to the B.o.T. Tariff and Import Policy Division, Room 3139, Horse Guards Avenue, London S.W.1. As usual in anti-dumping cases, a statement of the applicants' case will be made available to parties wishing to make representations if they undertake to treat the information it contains as strictly confidential and to allow their comments to be passed on to the applicants for reply.

It has been alleged that Italian polythene for moulding has been sold at prices considerably below the U.K. price of high-density material—1s 7d/lb. Some U.K. producers are also concerned at the prices at which some West German polythene has been arriving in this country.

Italy's polythene capacity has been expanding at a faster rate than elsewhere in Europe and is currently about double domestic consumption, which is estimated at a maximum of 35,000 tonnes. Capacity is expected to rise to more than 140,000 tonnes/year by 1963.

Italian producers with current and planned capacities are as follows:

PRODUCER CAPACITY PLANNED		
<b>Montecatini:</b>		
Ferrara	26,000	
Brindisi ...		30,000
<b>Celene:</b>		
Priolo ...	30,000	
<b>A.B.C.D.:</b>		
Ragusa ...	12,000	8,000
<b>Solvay:</b>		
Rosineano ...	12,000	4,000
<b>A.N.I.C.:</b>		
Gela ...		25,000
Totals ...	80,000	67,000

The Montecatini plant at Brindisi is due in production early in 1962. This year Celene raised their capacity from 16,000 to 30,000 tonnes/year and recently A.N.I.C., the chemicals operating subsidiary of the State-oil concern, E.N.I., raised their planned production at Gela, Sicily, from a previous 15,000 to 25,000 tonnes/year.

Polythene has also been slated for production in Sardinia by Rumianca. It is also a possibility at the new Ferrandina petrochemical complex, where it could be made either by Industria Chimica del Basento of the Montecatini Group, or by A.N.I.C. Detailed plans have yet to be released for this site but both these companies plan plastics units at Ferrandina, although current saturation of the Italian market—as well as throughout Europe—could, it is thought, lead to

postponement or rephasing over a longer term of current production plans.

Foreign competition is not only making nonsense of polythene profits in this country it has been hitting British overseas markets for some time. Since around 40-45% of U.K. production is exported, dumping in other countries is a serious problem. Earlier this year, Italian producers had taken a large slice of at least one traditional U.K. market for polythene—Spain.

## Hoechst director to visit Washington on polythene dumping mission

THE battle of cheap plastics continues to rage within the ranks of the European chemical industry. From Germany, where U.S. polythene is currently being offered at prices which those of the local manufacturers cap by 60% and those on the U.S. home market by up to 100%, comes the news of self-help from within the industry itself.

Dr. Wilhelm Menne, a director of Farbwerke Hoechst, Frankfurt, has stated that he plans to visit the U.S. in person next month for talks with Secretary of Commerce Luther Hodges aimed at the avoidance of the West German imposition of an anti-dumping duty on American polythene.

Meanwhile, the West German Society of Chemical Industry tells in its latest bulletin of the heavy price pressure on the country's plastics market due to 'unusually cheap foreign offers.' The import prices for p.v.c. have fallen by about 13% over this year, while a similar trend has been noted in the case of some softening agents, says the Society. Over the January to September period of 1961 price decreases for polythene averaged as much as 40%, some U.S. producers presenting offers definitely of the dumping class. Some 40% of all West German imports of plastic materials come from the U.S.

## World congress of man-made fibres

PROVISIONAL programme for the Second World Congress of Man-made Fibres has been issued. To be held in London on 1 to 4 May, the congress will be opened by Queen Elizabeth, the Queen Mother. The Queen has agreed to be patron.

'The impact of man-made fibres' has been adopted as the theme of the congress and it runs through all the addresses, lectures and conference sessions. Sessions will be held on the following themes: Man-made fibres: applied research, development, economics, distribution; The impact of man-made fibres on clothing, textile design and styling; polymerisation, etc.

From Holland it is stated that pressure from the U.S. is similarly making itself felt, despite the fact that the high-pressure polythene demand of the country can easily be met by the production of the Staatsmijnen of Limburg. An example of what effect price pressure has had on the Dutch polythene market is shown by figures that prove that the average price per kilo has fallen from between Fl.2.90 and Fl.3 two years ago to a present level of Fl.1.33 to Fl.1.40.

Although no mention has as yet been made of its possible use, the Italian Government has for its part just passed an anti-dumping Bill for the possible imposition of a special import duty on such goods as are imported either at price levels or with foreign subsidising help which could harm Italy's own production or prevent the building-up of an Italian industry in that field. This law could be of great interest when studied in view of the already-present petrochemical and plastics industry in Italy, and the ambitious plans for its expansion, particularly in under-developed areas. Over-cheap plastics and allied products could be the first whose exporters' heads would fall.

## Overseas competition in chemicals and plastics hits D.C.L. Industrial Group profits

A SHARP reduction in profit was experienced by the Industrial Group of The Distillers Co. Ltd.—which now includes the British Xylonite Co. Ltd.—over the half year ended 30 September. Exceptional competition from overseas in the latter part of this period, particularly in the chemical and plastics sectors, is named by the board as the cause of reduced margins in a statement issued to shareholders. This reduction took place in spite of a reasonably well maintained

turnover, and it is stated by the board that these adverse conditions still prevail.

As noted in 'Commercial News' (p. 974) the net profit of the Group after taxation is practically the same as last year, the increase in net profit (£16.4 million compared with £15.9 million for the corresponding period of last year) being offset by the increased rate of profits tax from 1 April. An interim dividend of 6% on ordinary has been declared as forecast last July.



## Project News

# W. J. Fraser handle two U.K. phosphoric acid plants

CONSTRUCTION phase is now starting on two phosphoric acid plants by **W. J. Fraser and Co. Ltd.**, Romford, the main contractors. Each plant has been designed for an annual capacity of about 1,500 tons of  $P_2O_5$  in the form of 30% phosphoric acid. Customers are **Richardson's Chemical Manure Co. Ltd.** (owned by I.C.I. and W. and H. M. Goulding Ltd.) and **Scottish Agricultural Industries Ltd.** (affiliates of I.C.I.).

The Richardsons' unit is sited at Belfast, where a large CCF plant is under construction and due for completion by the middle of next year. The S.A.I. plant is in connection with a £1.25 million project in hand to convert Sandilands, Aberdeen, works from superphosphates to ammonium phosphate and concentrated compounds.

The two phosphoric acid plants are being supplied by Fraser's under licence from Saint Gobain of France. A feature of the plants is that they incorporate the single reaction tank process jointly developed by Union Chimique Belge and Saint Gobain. Fraser's hold U.K. and Commonwealth rights for this and other Saint Gobain processes in the fertiliser field.

W. J. Fraser are also main contractors for a **Shell** lube-oil plant in Turkey and are currently engineering a complete unit for blending and packaging of lubricating oils.

## Dublin acid plant now in production

● THE 200 tons a day contact sulphuric acid plant at East Wall, Dublin, is now in production for **Sulphac Ltd.**, the operating subsidiary of W. and H. M. Goulding Ltd. Main contractors were **Simon-Carves Ltd.**, who also handled construction of the 70,000 tons/year acid plant of Sulphac at Marina, Cork. Combined outputs of these two plants is more than enough to supply all Eire's requirements for concentrated sulphuric acid.

The fertiliser plant at East Wall is also at an advanced stage of development and expansion.

The new Belfast CCF fertiliser plant under construction for **Richardson's Chemical Manure Co. Ltd.** (owned by I.C.I. and Gouldings) is on schedule for completion in the middle of next year. Main contractors are **Constructors John Brown Ltd.** **Simon-Carves** also have an acid plant under construction for Richardson's at Belfast.

## Lube-oil plant for B.P. Kent refinery

● THE Ferrofiner recently commissioned at the Dunkirk refinery of the **Soc. Francaise des Petroles B.P.** is the first

to use the new B.P. Ferrofining process, which as stated in 'Project News' 25 November, is now to be installed at the Llandarcy refinery of British Petroleum. The Dunkirk unit has a capacity of 3,100 b.p.s.d.; preliminary operation is said to have given satisfactory results.

Essential features of the process, developed at the Dunkirk research laboratory and the B.P. Research Centre at Sunbury-on-Thames, is the special catalyst. This enables hydrotreating to be used as a finishing process not only for solvent refined lubricants but also for straight distillate lubricates. Other Ferrofiner units are planned at the Isle of Grain refinery and at the new lube-oil plant to be constructed at Kwinana, Western Australia.

This is the first official announcement of B.P.'s plans to set up a Ferrofiner at their Kent refinery.

## Equipment contracts

# Orr pumps for Shell Chemical road tankers

● AFTER extensive tests pumping a wide variety of ketones and similar fluids including Teepol the **Shell Chemical Co.** have placed an order for 12 G.P. plastics-lined corrosion-resistant pumps with **Orr Products** of Stroud, Glos., for fitting to their new road tanker vehicles.

These pumps are leakproof, self-adjusting for wear and arranged in such a manner that the fluid being pumped is completely isolated from the ball bearings which contain a lifetime supply of lubricant. The design is such that the Orr G.P. pumps will run for long periods without any attention or servicing, and the corrosion resistant model will pump a wide variety of fluids satisfactorily.

## Turbo-agitators for Naples refinery

● SIDE entry turbo-agitators for Mobil Oil Co.'s large oil refinery in Naples are to be supplied by the **Moritz Chemical Engineering Co. Ltd.**, Kingston-on-Thames, Surrey, under an order worth over £11,000. The agitators incorporate a retractable shaft for repacking the gland without emptying the vessels.

## H. W. Associate to supply plant for Sasol

● AN ORDER for the supply of a multi-purpose column to the State-owned oil-from-coal plant **Sasol** has been received by **Wright Bong and Head Wrightson (Pty.) Ltd.**, Benoni, Transvaal, associates of Head Wrightson and Co. Ltd.,

## Simon-Carves research unit for catalysis



Dexion alloy slotted angle is used extensively in the research department of **Simon-Carves Ltd.**, Stockport. Apparatus shown here is for the study of catalytic processes, including the detoxification of towns' gas and the removal of sulphur compounds from fuel gases

**Thornaby-on-Tees.** The vessel will be 88 ft. long and will weigh 50 tons without the internal equipment. It is to be of all welded construction, 9 ft. 10½ in. diameter, with ¼ in. thick shell plating and ¾ in. thick dished ends.

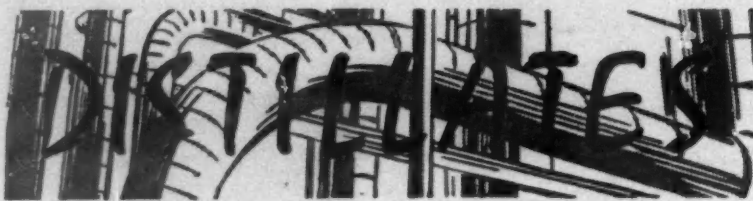
## Gears for Polish oxygen plant compressors

● THREE epicyclic gears for use on compressors to supply compressed air for the large tonnage oxygen plant being built by Constructors **John Brown Ltd.** at Tarnow (C.A., 12 August, p. 222) are to be supplied by **W. H. Allen Sons and Co., Bedford.** Allen received the order from **Hawker Siddeley Brush Turbines Ltd.**, London, who are supplying the three axial flow compressors (about 6,000 h.p.). Delivery of the first compressor set is due in December 1962.

## Glass heat exchangers for Dead Sea Works

● A CONSIGNMENT of glass heat exchangers, with connectors, has been sent to a site beside the Dead Sea in Israel, for use in the production of bromine from sea water, by **Q.V.F. Ltd.**, Stoke-on-Trent. The order was received from **Dead Sea Works Ltd.**, Pall Mall, London S.W. Plans for the expansion of bromine, potash and other chemical operations carried on by the Dead Sea Works in Israel were reported in **CHEMICAL AGE**, 8 October 1960, page 588





★ RECENT interest by overseas oil companies in the British market, described in this journal (25 November, p. 849) as having Europe's fastest growing demand, does not mean that newcomers are likely to have an easy time.

Mr. H. Wilkinson, chairman of Shell Tankers and a managing director of the Royal Dutch/Shell Group, said after the recent launching of the 48,500-ton tanker *Otina*, that Shell invested £200 million to finance the expansion of their U.K. activities to meet the growth in oil demand between 1952 and 1960.

Shell companies supply nearly a third of all petrol consumed in Britain, which as Mr. Wilkinson said has a greater total thirst for oil than any country in the world outside the U.S.

The group's refineries at Shellhaven, Stanlow and Heysham have been expanded and enlarged to cope with this mounting demand. Other companies too have expansion plans and British Petroleum are expected to disclose shortly their plans to add 1 million tons a year to the capacity of their Grangemouth refinery. Throughput at Grangemouth has risen 27% in the past year to 3.5 million tons and it is understood that long-term plans involve the doubling of that figure.

★ AN order, which is decidedly fishy although quite genuine, has been received by QVF Ltd. from Laboratorio Luteia of Rio de Janeiro. It is for glass plant especially designed for the extraction of glucosamine from the shells of crabs and lobsters. The equipment to be supplied, to the value of about £700, includes a hydrochloric acid absorption unit, hydrochloric acid generator, a concentration unit and hydrolysis and filtering equipment.

QVF are gradually opening up markets in Latin America where the use of non-corrosive glass equipment has obvious advantages in tropical climate. Mr. J. G. Window, sales director of QVF, is going on a tour of South and Central America in February. The company has already supplied a large chlorine cooling plant and a hydrochloric acid unit for Buenos Aires and is also doing well in Mexico.

★ COMPILING data sheets is not usually fun, but the technical personnel of I.C.I. Nobel Division must have found it difficult to keep a straight face when summarising the properties of silicone 'bouncing putty'.

These fascinating properties are set out formally enough in a new data sheet which now lies before me, although they read like a description of something seen

after a drinking party. Starting off with a colour of blue or pink, we find that the material has a rebound of 55 inches/min. when a 12 g. ball is dropped 100 in. on a soapstone surface, can be drawn slowly into long threads, yet shatters like glass if given a sharp blow. The technical data is followed by a warning that bouncing putty flows slowly when left in one place and that it should never be put into pockets.

Applications? Disappointingly meagre so far. It is used as an exerciser for crippled muscles, while a recent application is in the top-spring equalising device of a counterblow drop forging hammer. Bouncing putty is also used as a novelty item by makers of toys, so there may well be plenty of it finding its way into Christmas stockings this year—enclosed, I hope, in a suitable container.

★ How thunderclouds become electrically charged is the subject of a novel theory developed by F. W. Went of the Missouri Botanical Gardens. He suggests that small amounts of volatile matter such as terpenes and esters emitted by plants and which become stably polymerised in sunlight, can eventually decompose with the production of positive charges. According to the theory, the positive charge becomes concentrated on the surface of cloud and gives rise to fair weather currents and thunderclouds.

In support of the theory, it is claimed that the total amount of energy available from this source is compatible with that required by thunderclouds and that the global distribution of thunderstorms closely parallels the distribution of prolific vegetation.

★ USERS of multiwall sacks as well as paper and paper sack makers will ultimately be affected by a new scheme for marking repulpable sacks to facilitate salvage and sorting. 'Pernicious contraries' in many modern forms of paper are a menace to repulping operations, either permanently ruining the end product or choking the plant, so eleven trade and technical organisations and four major packaging firms have got together to devise a means of overcoming this.

The resulting proposal, outlined in B.S. 3440, Part 1, is to code all contrary-free sacks by printing close to the maker's housemark or in the gusset of the sack a symbol that will convey at a glance that the sacks are entirely of natural kraft and therefore can be repulped by standard processes.

If this scheme is adopted, it could well

ease the situation whereby the eventual users of sacks often have to pay to have them taken away after they have been emptied.

★ A BRICKLAYER's nightmare might include the image of a large sulphuric acid kiln such as the recently reconstructed 220 ft. long No. 1 kiln in the Products Works of I.C.I. Billingham. But the bricklayers who recently relined the kiln with 36,000 refractory bricks seemed happy enough at their task, notwithstanding the fact that some bricks were curved, some straight, varied in type to suit the differing temperature zones, and had to be laid to the curved surface and the kiln's taper—and all this in artificial light.

This was the first complete reconstruction on the kiln—10 ft. in diameter at the "high" end—since it was originally built and installed 35 years ago, and involved a shutdown of some four months. During this period an identical kiln alongside No. 1, and a larger, more recent kiln some distance away, continued their non-stop production of sulphur dioxide gas from the reaction in heat of anhydrite from the Mine Gas Plant ashes, coke breeze and sand. The No. 1 kiln is now once again in operation and adding to its veteran service.

★ THE story of Distillers Plastics Group is told in a new publication, designed to illustrate the diversification of end uses of their products.

Distillers took the first step into plastics when they acquired British Resin Products in 1937 and transferred their activities to a new factory at Tonbridge. Then the output was some 20 tons a year and the staff numbered 10. The Distillers Plastics Group, at Barry, now employs 1,800 people and the annual output exceeds 100,000 tons.

In addition to the activities of the Plastic's Group, Distillers have other plastics interests. They include the British Xylonite Group of companies (BX Plastics, Cascelloid, Halex, Extrudex, Expanded Rubber Co.), and British Hydrocarbon Chemicals (D.C.L. and B.P.). B.H.C. Rigidex polyethylene is marketed by British Resin Products.

★ SILVER Jubilee Year of William Freeman and Co. makers of rubber and plastics products, began on 2 December. Last year, Freeman started production at their new Suba-Seal works at Staincross, Barnsley. The Suba-Seal trade mark covers a wide range of products which, in the technical division, include patent closures which are supplied over a wide field of industry.

The Free-Flex trade mark covers the production of blown polythene containers which vary in their capacities from 1 oz. to 5 gall.

*Alembic*

## BELGIAN CHEMICAL INDUSTRY

# Belgium turns from coal to oil as source of power for expanding industry

**T**URNOVER in the Belgian chemical industry has shown a 58% gain since 1953 and accounts for about 7% of the total industrial output. Belgium is at present ninth in the world production of sulphuric acid.

Nearly all the raw materials required by the chemical industry are imported, coal and natural gas being the only commodities in plentiful supply. Major chemical imports are:

	'000 Tonnes per annum
Phosphates .. ..	620
Crude potassium .. ..	161
Potassium chloride .. ..	1,171
Sulphur .. ..	136
Pyrites .. ..	270
Salt .. ..	501
Crude oil .. ..	67,160

Belgium is among the world's largest producers of fertilisers, of which basic slag accounts for 62.5%. Nitrogen, potash and phosphoric acid used in fertilisers have increased in production since 1953, as shown in the following table.

	Nitrogen (Tonnes)	Potash (Tonnes)	Phosphoric acid (Tonnes)
1953 ..	1,797	980	663
1960 ..	2,322	2,514	3,910
1961 .. (estimated)	2,500	5,583	6,674

The Belgian fertiliser company, Carbochimique, is to link up with the French company, Soc. de Produits Chimiques et Engrais d'Auby, which concentrates on composite fertilisers, to exploit the market opportunities in Europe. Auby are short of nitrogen capacity for their composite products and Carbochimique have a capacity estimated at 400,000 tonnes a year.

In spite of vast natural resources of coal, Belgium is turning more and more to petroleum as a source of power. Since 1953 both production and consumption of petroleum products have more than doubled:

	Production		
	Fuel oil '000 tonnes	Lubricating oil '000 tonnes	Residues '000 tonnes
1953	178	0.4	7.4
1960	353	2.4	8.3
1961 (estimated)	431	2.3	15.1
	Consumption		
1953	73	0.3	5.4
1960	172	1.5	8.1
1961 (estimated)	195	1.2	17.1

Just after the second world war, two large refineries were built in the port area of Antwerp. One of these, the Société Industrielle Belge de Pétales, a 50/50 Petrofina and B.P. venture, is at

present undergoing a £10 million expansion, which is expected to increase output from 90,000 to 160,000 bbl./day. The other refinery is owned by Esso and has an output of 2,000 bbl./day. Both these refineries currently supply raw materials to Belgium's rapidly growing petrochemical industry.

Between these two plants a large petrochemical installation, Petrochim, was built in 1955 with a capital of B.Fr.790 million, part of which was lent by the Belgian Government and part of which came from industry. The first part of this enterprise was completed in 1955, the second in 1958 and the third in 1959. The following chemicals are currently made by Petrochim, who have a total production of over 40,000 tonnes/year: ethylene oxide, propylene trimer, ethylene glycol, propylene tetramer, diethylene glycol, detergent alkylate, cumene,  $\alpha$ -methylstyrene, acetone, acetophenone.

There are currently five firms in Belgium making use of these raw materials, no less than three of which have completed their plants within the last year.

The fifth firm using the by-products from S.I.B.P. and Esso is Solvay and Cie who manufacture many different plastics in their own factory. These in-

dustry has had a result on chemical exports which were 4.8% higher in 1960 than in 1959. Last year the total was 2,893,100 tonnes. Over 1960 the Belgian chemical industry invested B.Fr.3,500 million, of which 1,500 million was spent on plants opened during the year. The Belgian chemical industry has also attracted \$67 million of foreign investments, of which \$9 million came from the U.K. compared with \$46 million from U.S. companies. British companies which have invested in Belgium during the last year include Glaxo Laboratories Ltd., Fisons Fertilizers Ltd., British Glues and Chemicals Ltd., and Foundry Services International. A significantly higher figure of exports of chemicals from Belgium is forecast for 1962, when the effect of this big investment programme will have been felt.

The Belgian chemical industry is also emphasising foreign expansion and construction of chemical plants in other countries. Solvay, for instance, have a majority participation in Industrias Quimica Eletro Cloro of Brazil who will produce chlorine, and an important interest in Industrias Petroquimicas S.A. who hold a Phillip's license for polythene.

Company	Owned by	Location	Capacity	Products	On stream date
Amoco Fina	Petrofina and Amoco	Antwerp	5,500 t.p.a.	detergent additives, anti-oxidants	1961
Coblenham	Solvay and Union Carbide	Antwerp	—	polythene	1961
Solvic	Solvay and I.C.I.	Jemeppe sur Sambre	18,000 t.p.a.	vinyl polymers and copolymers	1949
Monsanto	Monsanto and Sidac	Ghent	—	polyvinyl butyral foils	1961

clude high density polythene, polyvinyl chloride and polyester resins. In addition, Solvay supply the rest of the plastics industry with a number of basic raw materials including methylene chloride, methyl chloride and chloroform.

It has recently been announced that on account of rising interest in their Ixan vinylidene chloride copolymer now produced in a pilot plant, Solvay are planning to set up a plant in the French Jura with an annual capacity of 10,000 tonnes. This plant is now under construction and will supply Ixan WN for coating cellulosic film, Ixan WA latex for paper coating and Ixan WV for transparent film extrusion packaging.

In addition, Solvay have recently started production of synthetic glycerine and various other allylic by-products and hydrogen peroxide.

This expansion in the Belgian chemical

## Merchanting of Strategic Goods

THE Strategic Goods (Control) Order 1961 which came into effect on Wednesday, 6 December continues the prohibition, except under licence of the disposal of strategic goods which are situated outside the U.K. to any authority or person in the Sino-Soviet bloc, or to any other person if there is reasonable cause to believe that the goods concerned will eventually reach the bloc.

The Order (S.I. 1961/2242, price 1s 6d) gives effect to the changes in the strategic embargo list published in the *Board of Trade Journal* for 11 August 1961.



## Heavy chemical workers pay claim to be heard next week

WAGE negotiations in the chemical industry will reach a critical stage next Wednesday, when the rejection of the claim of 60,000 workers in heavy chemicals, plastics and fertilisers will be under discussion at a meeting of the Chemical and Allied Industries Joint Industrial Council.

The claim for a substantial increase in wages was recently rejected by the Association of Chemical and Allied Employers (see *CHEMICAL AGE*, last week, p. 922). A.C.A.E. is also about to reply to a similar demand made on behalf of 25,000 workers in pharmaceuticals and fine chemicals, although when *CHEMICAL AGE* went to press no date had been decided upon.

The increases granted since the pay pause to 6,500 workers in B.P., Shell and Mobil refineries have helped heighten this unrest in the chemical industry. Petrochemical companies feel they are being put in a difficult position by the granting of wage increases by the parent oil company to refinery workers. Local agreements to give similar increases to petrochemical workers cannot be signed with the unions since the petrochemical companies are members of the national employers' association and are therefore bound to keep in line with the national rates.

Other companies are also experiencing unrest. Workers at I.C.I.'s Tees-side plants have already requested official union permission for power to start a local strike. I.C.I., who conduct their own wage negotiations separately from the Joint Industrial Council, recently rejected claims for 62,000 workers (see *CHEMICAL AGE*, 11 November 1961, p.

762). Union leaders agreed to adjourn the talks so that they could consider the company's replies, but they are now pressing for a reply to the further arguments they have put forward.

Although the reason given for the rejection of wage claims is that the industry cannot afford them, the unions feel that they are being made a victim of the pay pause. In a recent speech made to the annual conference of the Institute of Directors, I.C.I.'s chairman, Mr. S. P. Chambers, said that a firm line must be taken in wages to stop inflationary pressure. He went on to say that if employers were to say firmly that they could not afford to pay more wages, responsible trade union officials would accept the position.

Writing in the December issue of *I.C.I. Magazine*, Mr. Chambers said that failure to keep increases in personal incomes within the limits set by higher production is one of the most vital reasons for Britain's lack of competitiveness in world markets.

An offer of increased wages which makes a penetrating breach in the pay pause and is likely to arouse the envy of other workers even more is that granted by British Oxygen Company of 3d an hour to 4,000 workers. The offer when originally made two weeks ago was rejected by the unions but agreement was reached when B.O.C. decided to put the date from which the increase is to be paid forward to 18 December.

A strike of B.O.C. workers could seriously disrupt many industries. One day strikes followed the rejection of the original offer but the feeling of the workers generally was apparently against strike action.

## New round of titanium price cuts will boost usage in chemical plant construction

NEW price cuts for titanium foreshadow further applications of the metal to chemical plant construction. Following last week's announcement by Jessop-Saville Ltd. of Sheffield (the B.S.A. Steel Division) that reductions of about 10-15% on most titanium products would take effect about the end of the year, I.C.I. Metals Division have announced similar reductions.

Typical of the new prices announced by I.C.I. are: hot rolled plate, 1 in. thick, 43s (present price, 49s); commercially pure sheet, 8 ft. by 2 ft. by 20 gauge, 60s (73s); alloy sheet, 6 ft. by 3 ft. by 20 gauge, 125-142s (135-145s); commercially pure strip in coil, 9 in. by 28 gauge, 77s (86s); forged billet, 8 in. dia., 42s (48s); rolled rod, 1 in. dia., 47s (56s); extrusions, 82s (90s).

This is the sixth substantial reduction in titanium prices in seven years, so that the 'wonder metal' now costs less than half what it did when I.C.I. and Jessop-

Saville first began to produce it commercially. The new reduction appears to mark a further stage in the process whereby widening application and increased demand give the impetus to improved production techniques and increased output, thus leading to price cuts which again widen the applications.

New welding and fabricating techniques are also coming in to speed titanium's application to chemical plant, which, while still representing only a fraction of total titanium output—the aircraft industry taking the lion's share—holds promise of a rapidly growing market for the metal in the future. Among new chemical industry uses are: titanium anodes coated with platinum for electrolytic chlorine production, etc., a titanium plate heat exchanger produced by the A.P.V. Co. Ltd. and titanium 'wetted parts' for a submerged nitric acid pump by Appleton and Howard Ltd. (see *C.A.*, 27 May, p. 850).

## Doctors warned against use of chloramphenicol

A WARNING has been sent to all doctors in the National Health Service that chloramphenicol, a broad spectrum antibiotic derived from nitrobenzene, can prove lethal to patients. Marrow depression leading to a condition known as aplastic anaemia has resulted in a number of cases, usually following prolonged use and excessive dosage but there have also been a number of incidents following small doses for only three to five days.

A survey by the U.S. Food and Drug Administration showed that 139 cases of aplastic anaemia had occurred following chloramphenicol treatment, 96 of which had resulted in death.

Professor Clifford Wilson of the London Hospital draws attention to the situation in an article in the *Prescribers Journal*. Professor Wilson says that typhoid fever is the only common infection in which chloramphenicol is superior to other drugs.

## Unilever plan joint syndet venture in Chile

A NEW company to be known as Indus Lever S.A.C.I., is to be set up following an agreement between Compania Industrial and Unilever, which is subject to ratification. The joint company will produce and sell synthetic detergents, margarine and other edible fats.

Capital of the new company will be held on a 50-50 basis. First president of Indus Lever will be Mr. A. Edwards, president of Compania Industrial.

## Price cuts for Geigy plasticisers

PRICE reductions for a number of their plasticisers, effective from 4 December, are announced by the Geigy Co. Ltd., Manchester. Sebacates, azelates, adipates and phthalates are affected. In addition, the price of phthalic anhydride has been reduced and this is reflected in the greater price reduction for Geigy phthalate plasticisers, compared with the other products mentioned.

The price cuts have been made possible because of recent reductions in the price of certain alcohols, Geigy state.

## Filament wound glass-fibre tank by Whessoe

The filament wound glass-fibre tank displayed on the Fibreglass stand at the recent Engineering Materials and Design Exhibition was made entirely by Whessoe Ltd. at their Darlington Works and not by Fibreglass Ltd. as stated in *CHEMICAL AGE*, 25 November, p. 859. The reinforcement only was supplied by Fibreglass.

## S.C.I. buyers' guide

The 1962 edition of the *Chemistry and Industry buyers' guide* is now available at 7s 6d. from the Society of Chemical Industry, 14 Belgrave Square, London S.W.1. It includes sections on chemicals, chemical plant, and laboratory equipment and apparatus.





L. to r. at the Ramsay Chemical Dinner; Prof. A. W. Johnston (Nottingham University), Prof. M. Stacey (Birmingham University), Mrs. Raphael, Prof. R. A. Raphael (Glasgow University), Mrs. Curran, Dr. S. C. Curran, Mrs. Craik and Dr. James Craik

## CHEMISTS HOLD KEY TO USE OF THERMONUCLEAR POWER

WE are living at the threshold of great things in chemistry, Dr. S. C. Curran, principal of the Royal College of Science and Technology, Glasgow, said when he proposed 'The profession of chemistry' at the annual Ramsay Chemical Dinner held in Glasgow on 7 December. Dr. Curran said we were entering still greater days in chemistry, greater even than the days of Sir William Ramsay, who, if the chemists had not claimed him as a great chemist, he would claim as a great physicist.

Looking into the future, he thought that chemists would follow up the first success in controlled thermonuclear power that physicists must achieve, and bring about industrial application, as they were now doing with uranium power. He hoped that the ultimate form of power was not too long delayed, as our prosperity on this planet would hinge closely on our capability of producing abundant and cheap power by all available means.

That was the key to the second great advance to which they looked forward: the use of that power in the synthesis of all or almost all the materials that man would require for his well-being. Man had to free himself from chance creation and chance distribution on the earth's surface of necessary materials,

and by synthesising make them plentiful. Dr. James Craik, former chairman of the I.C.I. Nobel Division, replied to the toast.

Proposing the toast 'The City of Glasgow', Dr. A. J. Amos, president, Society for Analytical Chemistry, said that Glasgow had played a very great role not only in experiment but in the teaching of applied chemistry and technical education generally. It was in Glasgow, nearly 100 years ago, that the first chair was created in applied chemistry. Mrs. Jean Roberts, Lord Provost, replied.

Professor J. Monteath Robertson, of the Gardiner Chair of Chemistry at

Glasgow University, proposed 'The Guests', to which Professor M. Stacey, head of the Chemistry Department, Birmingham University, replied. A vote of thanks to the chair was proposed by Dr. J. A. B. Smith, director of the Hannah Dairy Research Institute, Auchencreeve.

The Ramsay Dinner is held under the auspices of the Society of Chemical Industry (Glasgow section), with the co-operation of the Alchemists' Club, Glasgow University; S.A.C. (Scottish section); Andersonian Chemical Society, the Anthraquinone Club; Ardeer Chemical Club; Chemical Society; Institution of Chemical Engineers (Scottish Group); Institute of Fuel (Scottish Section); Royal Institute of Chemistry (Glasgow and West of Scotland Section); Institution of the Rubber Industry (Scottish Section); Plastics Institute (Scottish Section); Society of Dyers and Colourists (Scottish Section); and the Institute of Sewage Purification (Scottish Branch). Convener of the Ramsay dinner committee is Mr. John Brooks, I.C.I. Nobel Division, Ardeer.

## I.C.I. to import 200,000 tons/year of fertiliser materials for Severnside works

SOME idea of the output and size of the new I.C.I. fertiliser works at Severnside, now in course of development, was given at an inquiry held at Bristol recently when a local transport firm applied to the Western Area Traffic Licensing Authority to operate eight specially constructed vehicles for the conveyance of raw fertiliser materials from the docks at Avonmouth to the factory site five miles away.

The plant is not expected to be in operation till the end of next year or the beginning of 1963, but arrangements for road transport are already complete. In the first year of operation estimated tonnage of imports is 100,000 tons; in the second year 150,000 tons and in the third year (1965) 200,000 tons.

These figures were given to the Authority by Mr. Kenneth Shannon, transport officer, I.C.I. Severnside Works, when he gave evidence in support of the road transport contractors. The raw materials, he said would be imported from the U.S., France and Germany. He declined to give any details of the chemicals.

To deal with this new traffic the Port

of Bristol Authority are installing a special transporter crane to handle it. This crane will be capable of discharging the materials at the rate of 250 tons an hour. Special receiving facilities are also being constructed at the factory consisting of a ground hopper into which the road vehicles will tip. This in turn will feed a mechanical conveyor by which the material will pass to a storage silo.

The road transport vehicles will have specially constructed bodies that will be impervious to corrosion and thus prevent spilling on to the roads.

Mr. Shannon said that developments beyond 1965 could not be clearly foreseen "but there was every hope that they would continue". It was anticipated that the raw materials would be shipped regularly throughout the year.

### Pfizer give Xmas card money to charity

Pfizer Ltd. are this year departing from their usual practice of sending out Christmas cards to customers and acquaintances. Instead they have donated the money to various charities.



A. F. Williams, chairman, Scottish Section, S.A.C., and Mrs. Williams, at the Ramsay Chemical Dinner

## B.A.S.F. expect record sales and production expansion in 1961

**A** TURNOVER of DM2,600 million, of which some 37% will have come from export sales, is expected by the West German company Badische Anilin- und Soda Fabrik AG. over the current year. Over 1960, as was stated in *CHEMICAL AGE*, 29 April, p. 696, the company had a turnover of some DM2,588 million (before revaluation of the mark), the export share again being 37%.

In no previous year, states a letter to B.A.S.F. shareholders, were such quantities of goods sold by the company and in no previous year was expansion of production plant so great, more than DM450 million having been spent on the main Ludwigshafen plant alone. Successful rationalisation measures countered loss of profits on certain commodities, the effect of revaluation of the mark and increased labour costs, so that shareholders will be presented with a good result for the year. Unless any unforeseen factors intervene, the company will be able to recommend a "satisfactory dividend" on the increased capital at its coming annual general meeting, to be held on 14 May 1962. Productivity per employee was increased over the year.

Sales of plastics, which make up an important part of the company's turnover, continued to rise over this year. In some cases quantitative sales over the past few months have been higher by over 20% than those for the corresponding 1960 periods. A similarly satisfactory

development was noted for plastic dispersions, synthetic resin glues, lacquer resins, solvents and softening agents. In certain fields of the plastics programme, however, revenue losses were suffered, particularly in cases in which foreign competitors disposed of their excess production on the European market at dumping prices.

Turnover in the field of nitrogenous fertilisers is expected to be at normal levels. The B.A.S.F.-developed nitro-fertiliser Floranid, intended primarily for lawns and ornamental plants and with a particularly long lifetime, has been introduced with very great success. New preparations have been introduced into the company's plant protection media sales programme over the year and the turnover has increased by a greater rate than usual.

The sales development of the dyestuff and dye auxiliaries sector brought with it a satisfactory turnover increase, both quantitatively and qualitatively, on both home and export markets. Novelties in this sphere were the Primazin assortment of reactive dyes and the quality pigment Paliogen dyes.

As well as the invention of new products and processes by the B.A.S.F. laboratories, the company sold numerous licences and know-how during the year. It built, for itself and others, chemical plants in France, Egypt, Turkey, India, Japan and the U.S.

### In Parliament

## Farm chemicals research to continue

**T**HE Government intends to 'press on' with fundamental and applied research on chemicals used in agriculture, to close the gaps mentioned in the report of the Research Study Group on Toxic Chemicals in Agriculture and Food Storage (see *CHEMICAL AGE* last week), Mr. C. Soames, Minister of Agriculture, said in answer to a question in the House of Commons last week.

Asked by Sir J. Maitland what further action he would take to reduce casualties to wild life due to the use of deleterious chemicals, and what progress had been made in producing chemicals of equal agricultural efficacy which have no lethal effect, Mr. Soames referred to the favourable findings regarding the majority of agricultural chemicals and mentioned the restrictions on the use of cereal seed dressings containing aldrin, dieldrin and heptachlor. His department would, however, he said, intensify its survey of wild life casualties, as recommended by the Research Study Group, and consider after next season, with the interests concerned, whether any further action was necessary.

(The Nature Conservancy, in its annual report issued last week, said that events during the past year have shown that the serious concern felt by the Conservancy about the impact on wild life of toxic chemicals, and the urgency which they attributed to the problem have been fully justified. The report acknowledges the ban on seed dressings containing aldrin, dieldrin and heptachlor during spring sowing as an important step forward, but adds that it "would be wrong to assume that the general problem had been solved".—Editor.)

### Commons question tabled on sodium chlorate

Mr. J. P. W. Mallalieu (Lab. Huddersfield E) is to ask the Home Secretary in the Commons on Thursday, 21 December, whether he is aware that sodium chlorate can easily be made into a dangerous explosive and that it has already caused serious accidents; and if he will introduce legislation to prevent the sale of it to children.

### Sponsored research on pesticides

**A** NEW company, Pesticides and Agricultural Developments Ltd., has been formed by Dr. M. A. Phillips and Associates, to undertake sponsored and specialist research and development work on new insecticides, herbicides, nematocides, etc. It will also study formulations for pesticides and agricultural products, with special reference to the proper use of the appropriate wetter or surface active ingredient.

Dr. M. A. Phillips is acting as consultant to the new company, which with the parent organisation, operates from 9 Western Road, Romford, Essex.

Discovery that systemic insecticides require a non-ionic wetter for penetration and that anionic wetters are mainly of service for spreading surface acting pesticides such as DDT or BHC, was made in the laboratories of Dr. M. A. Phillips and Associates and was confirmed in field work on sugar beet in 1958 and 1959.

### Chemical shipments from Liverpool

**EXPORTS** of chemicals, drugs, dyes, etc., from the port of Liverpool in the year to 1 July 1961 totalled 1,083,720 tons, as against 980,723 tons in 1960, 915,092 tons in 1959, 812,028 tons in 1958 and 935,580 tons in 1957.

For soap and oils, fats and resins the figures are: 1961, 292,808 tons; 1960, 259,301 tons; 1959, 234,693 tons; 1958, 242,870 tons; 1957, 284,870 tons.

Imports of chemicals, drugs, dyes, etc.: 1961, 134,105 tons; 1960, 131,365 tons; 1959, 104,652 tons; 1958, 121,051 tons; 1957, 108,081 tons. Soap and oil, fats and resins: 1961, 33,187 tons; 1960, 22,430 tons; 1959, 15,432 tons; 1958, 12,870 tons; 1957, 17,169 tons.

### International Coal Preparation Congress

The fourth International Coal Preparation Congress organised by the National Coal Board and the Coal Preparation Plant Association of Great Britain is to be held in the U.K. at Harrogate, 28 May to 1 June 1962.

The congress will include sections devoted to: the relationship between the feed consumption, plant design and product quality; automation and control; preparation of small material; flotation and preparation of fine material; determination of washability and separation efficiency; moisture reduction; and trends and developments.

### £1 million chemistry block at Manchester

**A** £1 million chemistry block, to be built for Manchester University at Chorlton-on-Medlock, is due for use in the academic year starting in the autumn of 1962. Work on the building will start early in 1962. The new block will consist of two sections, one of five and one of eight storeys.



## N.B.S. gas-liquid chromatography apparatus offers fully automatic purification of liquids

FULLY automatic purification of liquids by gas-liquid chromatography is now possible with apparatus developed at the U.S. National Bureau of Standards. Using automatic, timed sample injections and automatic collection based on peak height on a recorder, the preparative-scale chromatograph has produced materials of 99.95% purity. In purifying large quantities, it can be operated without interruption for an indefinite period. It has been found especially suitable for purifying the major component in a solution containing small amounts of impurities.

This purification system is relatively easy to construct and requires only simple electrical controls. Sample contamination is avoided because the sensitivity of the detector is preset so that the collector valve is controlled only by the recorder trace of the major component.

### Thermal conductivity effects

The detection system used to signal the appearance of the components is based on measurement of thermal conductivity. When a constant flow of gas passes over a fine wire heated by an electric current, the rate of heat loss by the wire is constant. A change in composition of the gas stream will alter the thermal conductivity. This causes a change in heat loss which results in a change in resistance. These changes are amplified and recorded as a series of peaks on the chart of a recording microvolt meter. The peak heat and/or peak area on this plot is roughly proportional to, and thus represents, the relative quantity of a specific component.

In the N.B.S. purification process, the mixture is automatically introduced into the column with a microbellows pump which can deliver from 0.05 to 1.0 ml. per stroke. By setting the clock controlling this pump, a new aliquot will be automatically injected at specific intervals depending on the retention times of the components being separated. Usually the cycle is 20 to 60 minutes.

Upon leaving the pump, the mixture is vaporised in a flash evaporator just before entering the column. It is then carried through the column by the carrier gas.

As the gas emerges from the column, the components are detected by the hot wire thermal conductivity unit.

To check the effectiveness of the apparatus, the N.B.S. used it to purify toluene and ethylbenzene. From freezing-point analysis, the purity of 80 ml. of toluene, collected at a rate of 25 ml. per day, was found to have increased from 99.4 to 99.95 mole %, whereas the purity of 70 ml. of ethylbenzene, purified at a rate of 13 ml. per day, was increased from 99.1 to 99.8 mole %.

A complex mixture of mesitylene containing many impurities was found to be more difficult to purify. However, after two separations with the automatic apparatus, chromatographic analysis indicated the purity was substantially increased.

## New, economic aluminium reduction cell uses special refractory hard metals

CLAIMED to represent the first basic alteration to the electrolytic reduction process which the world's aluminium industry has been using for some 75 years is a modified type of reduction cell utilising refractory hard metals as essential elements. This development can substantially reduce the cost of producing aluminium and also permit expansion of the capacity of existing facilities with relatively small capital expenditure. An improvement of up to 15% in cell operation can be achieved, either by a decrease in the energy consumption per lb. of metal or by an increase in metal output per pot.

The new type of cell was announced jointly by the British Aluminium Co. Ltd., London, and Kaiser Aluminium and Chemical Corporation, Oakland, California, both of whom are currently using the development in certain of their reduction facilities. They plan to continue making refinements in its application to existing cells in order to ensure further the successful adaption of the development to all types of reduction cells.

The development emerged from research by British Aluminium in the early 1950's. Kaiser Aluminium joined with B.A. in the mid-1950's in a research programme aimed at the further develop-

ment of the basic inventions. Since then, the two companies have co-operated in the development of the refractory hard metals and their application to both existing and new electrolytic reduction cells. The companies have also obtained basic patent protection in the principal aluminium companies of the world. Details of the cell and precise nature of the refractory hard metals are not being revealed at present (typical refractory hard metals are the carbides and borides of titanium and zirconium) but the development is to be described in a paper to be presented at the International Symposium on the Extractive Metallurgy of Aluminium to be held by the American Institute of Mining and Metallurgical Engineers in New York City as part of its annual meeting in February 1962.

### MacLellan acquisition

George MacLellan and Co. Ltd., Glasgow, have acquired the minority interest in Cochrane Protective Clothing Ltd., who as a wholly owned subsidiary of the parent company will in future be known as MacLellan-Cochrane Ltd. The board remains as before with the addition of Mr. D. M. Lean, MacLellan development director.

## Chemical export executives in conference

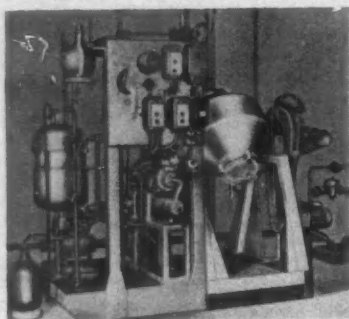
General view of the group which discussed chemicals at the recent National Convention held at Eastbourne by the Export Council for Europe. Directors and export, sales and distribution executives attended from many of the leading British chemical producing companies





# Equipment news and trends

**N**OW being distributed by a U.K. company is a new vacuum tumbler rotary dryer, the glass-lined French Danto-Rogeat unit. Advantages claimed for this equipment are that the outer jacket can be heated by steam or a high



temperature fluid and that the condenser is fitted between the outer dryer and vacuum pump for the purpose of trapping corrosive gases and solvents.

The equipment is stated to be especially suitable for the treatment of delicate crystalline substances which would otherwise be damaged by overheating. The crystalline solids can be recovered without harm, and no screening of the product is necessary afterwards. Great economy in operating time is claimed for these units, which are made in three sizes: 100, 600 and 2,000 litres.

The same suppliers are also importing from France a range of glass-lined reactor vessels, distillation columns and other glass-lined equipment, including jacketed reaction vessels of 22-4,000 gall. capacity.

Russell Constructions Ltd., Adam Street, Strand, London W.C.2.

New to Europe is a vibrating screen separator known as the Sharples-Kason Vibroscreen. The Vibroscreen generates a unique multiplane motion which imparts both horizontal and vertical motion to the material being screened and the resulting component of these two motions can readily be adjusted by the operator in a few minutes to give the screening pattern best suited to the particular operation.

Suitable for both wet and dry screen-

ing operations, the Vibroscreen can yield up to five fractions being separated continuously.

Sharples Centrifuges Ltd., Tower Works, Doman Road, Camberley, Surrey.

A new drum mixer allows standard drums of 16 in. dia. by 20 in. long or 24 in. by 33 in. long to be used in conjunction with the removable paddle of special design. The interchangeable drums allow almost continuous mixing, if desired. Drive to the rubber-tyred rollers is by a Holroyd F.M. worm reduction gear unit, driven by a  $\frac{1}{2}$  h.p. flange mounted motor. The whole unit is mounted on a stand, a foot pedal start and stop switch being provided.

Manesty Machines Ltd., Speke, Liverpool 24.

For general use in laboratories, etc., and with its light weight making it useful for portable kits, is a 100 ml. measuring cylinder moulded in Tyrol 767 styrene/acrylonitrile copolymer—a high clarity, high impact plastics material marketed by British Resin Products Ltd. Cylinder is graduated to B.S. 604 : 1952.

Technical Treatments Ltd., Otford, Kent.

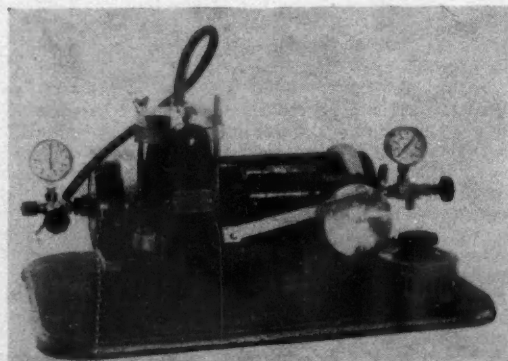
Fully automatic tube filling machine incorporates photo-cell registration and automatic feed, giving an output of up to 60 tubes/min. Can be used for the portioning and filling of pastes, creams, liquids, etc. With standard parts, tubes of up to  $1\frac{1}{2}$  in. dia. and up to  $7\frac{1}{2}$  in. long can be filled; change parts available for handling large tubes of up to  $1\frac{1}{2}$  in. by 8 in.

Arengo-Alite Ltd., Pixmore Avenue, Letchworth, Herts.

Production of a new reinforced plastics storage tank, developed for use either as a water storage cistern or as a corrosive liquid container, is announced. Of 30/25 gall. capacity it is moulded in polyester/glass fibre. The tank is unaffected by most organic and inorganic acids and resistance to oils, solutions and solvents

## LOW-PRESSURE HYDROGENATOR

Low pressure hydrogenator complete with controlled heating unit, recently introduced by Chas. W. Cook and Sons Ltd., Perry Barr, Birmingham 22B, and briefly described in these columns, 2 December issue. The whole apparatus, complete with gas reservoir, shaking mechanism, etc., is mounted on polished wood baseboard



is excellent. Solvents such as carbon tetrachloride and tetrachloroethylene, for example, can be retained almost indefinitely.

Osma Plastics Ltd., 561 London Road, Isleworth, Middlesex.

Useful for chemical stirring and other applications, especially where electric motors would create a risk of fire or explosion, is a range of pneumatic motors, available in range of sizes and capacities. In conditions where silence is important, these motors are available with exhaust collector rings, to which a flexible hose can be attached and the exhaust air can be taken right away from the job, thus almost entirely eliminating the noise.

Desoutter Brothers, Ltd., The Hyde, Hendon, London N.W.9.

Designed primarily to give highly accurate colorimetric determinations of trace elements in liquid samples, the EEL flowthrough spectra incorporates a continuous spectrum wedge optical filter, having a bandwidth of 30 mμ, giving accurate wavelength selection over the range 400-700 mμ. Results are indicated on the 15 cm. scale of the spot galvanometer which is calibrated in inverse logarithmic divisions, 0-100.

Evans Electro Selenium Ltd., Halstead, Essex.

Continuous indication of the density of liquids and slurries flowing through piping under constant pressure is provided by a nucleonic fluid density gauge, in which a radioactive source and an ionisation chamber are mounted on opposite sides of a pipe containing liquid or slurry. The radioactive source emits radiations which pass through the pipe wall and are absorbed by the fluid in proportion to its density. Radiation reaching the ionisation chamber sets up a current flow which is inversely proportional to fluid density and can be used as a basis for measurement.

Besides giving a meter or chart recorder indication, the signal from the ionisation chamber can be used to control fluid density via suitable transducers.

Baldwin Industrial Controls, Dartford, Kent.

# POSITIVE LINK BETWEEN RESEARCH AND GROWTH

## F.B.I. report on industrial research

COMPREHENSIVE information on research expenditure is difficult to collect and its assessment is a lengthy process. The last time a report on research expenditure was published was in April 1960 when the D.S.I.R. issued their findings on research and development expenditure for 1958 (see *CHEMICAL AGE*, 23 April 1960, p. 673). The latest report, which covers the period 1959-1960 (the initial questionnaires were sent out in May 1960), is, therefore, welcome indeed. The report ('Industrial research in manufacturing industry') was prepared by the Federation of British Industries with the co-operation of the National Institute of Economic and Social Research and is available from the F.B.I. at 40s.

### Research expenditure

The report shows that F.B.I. members in manufacturing industry—accounting for 90 to 95% of the research and development expenditure of all manufacturing industry—spent a total of £250 million on research and development, excluding capital, and employed a total manpower of 120,000, of whom 28,500 were qualified scientists and engineers on research and development. On an average, some £8,750 is expended per qualified man per annum. The total research expenditure for 1959-1960 contrasts with a figure of approximately £300 million estimated by the D.S.I.R. to have been spent by industry in 1958.

The outlay on research is by no means evenly distributed over the whole of industry. Excluding aircraft, chemicals and electrical engineering employ some 60% of all the qualified men engaged in research and development. The research ratios for the chemical industry (i.e., the ratio of the number of qualified men engaged in research and development to the total employed) is 1.72 per 100 compared with the average for all industries of 0.66 per 100.

On the average, excluding aircraft, the distribution of research activity is roughly in the proportion of 10% for basic research, 35% for the development of existing products or processes, 35% for the development of new products and 20% for technical and other services. The proportion of expenditure devoted to basic research is above average in the chemical industry as might be expected.

The main purpose of industrial research and development is to prepare profitable new or improved products or processes. It is estimated that about half the work undertaken, apart from basic

research and technical services, has found commercial application and another third is expected to find such application soon; only about one sixth has failed to find application.

The survey made an attempt to indicate whether it can be said that the firms which spend relatively most on research and development are those which grow fastest or are the most profitable. Growth was measured by two financial criteria, derived from the published accounts of companies: the annual average increase in net assets, 1949-1959 and the annual average increase in net tangible fixed assets 1949-1959. From the same source profitability was also measured by the annual average rate of return on the capital employed (i.e., the ratio of total profits to total net assets) for the individual firms over the same period. The research and development indicators chosen for comparison were internal expenditure on research and development per 100 employed, 1960 (the internal expenditure ratio) and the number of qualified scientists and engineers (Q.S.E.) engaged on research and development per 100 employed 1960 (research ratio).

### Research and growth

Nearly all the results indicate a positive association between growth, profitability and research ratios. In chemicals, the five firms (out of 22) which grew fastest in terms of total net assets had a level of internal expenditure per 100 employed  $2\frac{1}{2}$  times as high as the five firms which grew least, and a Q.S.E. ratio three times as high. Again the five chemical firms with the highest figures for internal research expenditure per 100 employed showed a rate of growth in total net assets half as high again as that of the five firms with the lowest research expenditure.

It thus seems possible to demonstrate positive association between growth, profitability and research ratio in extreme cases. The question of whether the association exists throughout the whole range of firms was the subject of a regression analysis. The indications are that a slightly greater rate of growth than the average for the industry is not associated with a slightly larger research ratio.

In the case of royalties and know-how payments, information on expenditure was much less complete, but the evidence suggests that large firms (over 2,000 total employment) spend a little over 2% of the internal expenditure on this item, and medium firms (300-2,000)

about 4 to 5%. The evidence suggests that licensing arrangements are almost always supplementary to the firm's internal research activity and only rarely a substitute for it. The report quotes a comment from 'a large chemical firm' as typical of a number received in support of this conclusion.

"We acquire manufacturing know-how from outside organisations when the information is not available from our own research activities or when offered processes appear better than those available from internal sources. It is a good spur to research to have this competition from outside organisations. Licensing arrangements also allow greater concentration of internal effort on major areas. Licensing by us of some of our know-how to other companies helps to support adequate research in these licensed areas."

This particular firm spent nearly £100,000 on royalties and know-how, amounting to 19% of the internal expenditure. The chemical industry as a whole spent £651,200 on this item. The total for all the respondent firms was about £3½ million. As some large firms did not reply it is possible that a grossed up figure may show a higher proportion of the internal expenditure devoted to royalties and know-how; perhaps nearly 3% or £7 million.

The survey cannot establish whether research and development in industry are at their maximum level of efficiency, but it does show that research as a whole in the U.K. compares reasonably closely to the U.S. (the only country for which comparable figures are available) bearing in mind the differences in industrial output and the cost of research in the two countries.

### Chemical plant deliveries at record rate

Deliveries of chemical plant in the second quarter of 1961 were valued at £18.5 million, compared with £12.4 million in the previous quarter and with £9.8 million in the second quarter of last year. Total for the first half of 1961 is £30.9 million, compared with annual totals of £44.4 million in 1960, £37.3 million in 1959 and £50.3 million in the record year of 1958.

### Petrochemical enquiries from Poland

Enquiries for chemical and petrochemical plant are among those received by the five-man Scottish trade delegation, who have recently returned to the U.K. after a week of talks with the Polish trade authorities.

### New chair for Imperial College

A chair in the History of Science and Technology, which will eventually have a department for research into and study of the subject, is to be instituted by the Imperial College of Science and Technology. A 'generous contribution' towards the cost of maintaining the new department has been made by I.C.I.



## Overseas News

# GULF OIL TO BE HOLLAND'S FOURTH OIL PRODUCERS

GULF OIL are planning their second European oil refinery and Holland's fourth at the Europoort site in Rotterdam. Gulf's first plant is now being built at Stignaes, Denmark, by Kellogg International Corporation, London.

The statement made by Mr. C. D. Read, vice-president of Gulf-Eastern Co. Ltd., last week concerning plans for the Netherlands, was a preliminary announcement of intention—contractors have yet to be appointed. Cost of the project will be £15 million and the refinery will process 1.5 million tons of crude a year, or 30,000 b.p.s.d.

The "usual range of petroleum products" will be made. There will be two docks at the refinery with facilities for the discharge of crude from super tankers and for loading refined products and LPG.

Other oil producers in the Netherlands are Caltex Petroleum Mij with 59,000 b.p.s.d. at Rotterdam; Esso Nederland N.V., with 100,000 bbl./day brought on stream at Rotterdam late in 1960 and Shell Pernis Raffinaderij N.V. with the largest capacity, at Pernis, of 300,000 bbl./day.

## New Carbyne facility under construction

Carbyne weedkiller will be the first product of a plant under construction by Spencer Chemical Co. at Jayhawk Works, near Pittsburgh, Kans. The new plant is the company's first venture in the organics field. Production of Carbyne is due to start by mid-1962.

## Montecatini licences for Mexican company

The Mexican chemical concern Meximont S.A. are to build three production units in Mexico with technical aid from Montecatini, Milan, who will also supply patent licences. These will be for the production of polyester and glass-fibre-fortified plastics sheets (this to cost 5 million pesos and to open in mid-1962), plastics foils and synthetic fibres.

## Wyeth to build hormone plant in India

A plant costing some 20 million rupees for the production of gonadic hormones is to be erected near Bombay by the Indian company Wyeth Laboratories Ltd. The plant will start production during 1962. Wyeth Laboratories were formed with Indian capital and with participation from the Wyeth International Inc., U.S., during 1960.

## Caustic soda plant for Colombia

The Banco de la Republica is to finance erection of a new soda plant in Cartagena, Colombia, to cost some 150 million pesos. The unit, which will consolidate the production of the Zipa-

quirá works, will produce caustic soda and other products on the basis of salt from the marine mines. It is believed likely that part of the production will be offered for export. Equipment is expected to be purchased in France.

## Du Pont plan ammonia unit for adiponitrile

Construction will begin in 1962 on an ammonia plant planned by Du Pont at their Victoria, Tex., site. The ammonia will be used by Du Pont to make adiponitrile at Victoria. The unit is expected to be in production towards the end of 1963. Du Pont already make ammonia at Belle, W. Va and Repauno, N.J.

# Styrene monomer and polymer plants planned by Aquitaine to use Lacq gas

Soc. Nationale des Pétroles d'Aquitaine are planning to take up production of 25,000 tonnes of styrene monomer and 10,000 tonnes of polystyrene annually. The necessary base products will come from the Lacq natural gas reserves. Capacity for styrene production will possibly be expanded at a later date. The production programme is based on the expectation that French consumption will grow in the future, while any such surplus over and above home demand is scheduled for export.

## Chemical plant company formed in Holland

The production of and trade in chemical plant and other ferrous constructions is the aim of NV Schoonebeekse Machinefabriek en Chemische Apparatenbouw, now formed in Schoonebeek, Holland. West German and Dutch private persons are among the first shareholders in the 500,000-florin company.

## Italian-built fibre plant for Japan

A complete plant for the production of Lilon polyamide fibre is to be supplied to the Japanese firm of Kanegafuchi, Tokyo, by Snia Viscosa of Milan, Italy. Under an agreement between the

## B.A.S.F. Mitsubishi to make Styropor

The Japanese Government has given its approval to the formation of a joint subsidiary of the Mitsubishi Petrochemical Co. Ltd., Japan, and B.A.S.F. Handels- und Export-GmbH, a 100% subsidiary of Badische Anilin- und Soda-Fabrik AG. The subsidiary, to be called Yuka-Badische KK, will erect a plant at Yokkaichi, near the Japanese town of Nagoya, for the production of the B.A.S.F. synthetic foam base Styropor at an annual rate of 3,000 tonnes. Output is to start in 1963, plant construction to begin in the near future.

## Monsanto to increase vinyl acetate capacity

An increase in capacity of 45 million lb. a year vinyl acetate monomer is planned by Monsanto at their Texas City plant. The plant scheduled for completion by the end of 1962 will be designed and constructed by Scientific Design. The output of the new unit will be used by Monsanto for the manufacture of plastics and emulsions. The raw material acetylene is made at the Texas City site and the acetic acid, which is derived from ethylene, will come from Monsanto's Chocolate Bayou, Tex. plant.

two firms, a non-exclusive production licence for this fibre and technical assistance from Snia Viscosa also go to Kanegafuchi.

## New chemical agent for fertility regulation

Discovery of a new progestin compound which is said to have potential use in the regulation of fertility is reported in the U.S. by scientists of the Merck Sharp and Dohm Research Laboratories, a division of Merck and Co. Inc., Rahway, N.J. In animal tests, it appears to be as effective as progestins now available, at a substantially lower dosage, according to the report.

The new compound is described in the current issue of *J. Am. Chem. Soc.* as "the most active of a new class of 19-norsteroid progestins—the first to contain a chloroethyl group." Chemically, it is 17 alpha-chloroethyl-19-nor-4,9(10)-androstadiene-17 beta-ol-3-one.

## Bulgarian chemical exports rising

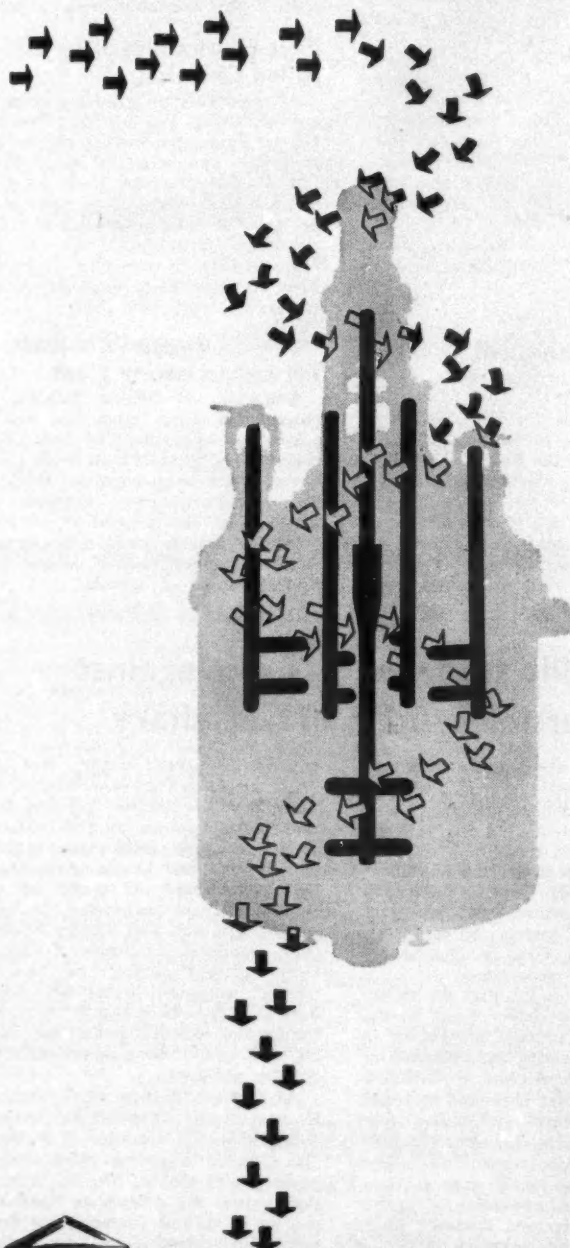
Over the current year Bulgarian authorities anticipate total national chemical exports worth 220 million leva, as compared with a 1960 export value of only 149 million leva.

(Continued on page 970)





## Metal alkoxides and acetylacetonates



Derivatives of catalytically active metals which are soluble in organic media are becoming increasingly important to the organic chemist in his search for high reaction yields under easily attained conditions. Metal alkoxides and acetylacetonates, for example the derivatives of Al, Co, Cu, Fe, Ni, Ti and Zr, for use as catalysts, co-catalysts, and curing agents can be supplied for your evaluation.

For further details write to the Product Development Department, Peter Spence and Sons Limited, Widnes, Lancs.

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## Overseas News

# NEW FOREIGN-BACKED INVESTMENTS FOR SOLVENTS, GLYCERINE UNITS IN ITALY

**PETROLEUM** (Lire 12,600 million) and chemical-pharmaceutical industries (Lire 10,500 million) took the largest slice of foreign investments in productive enterprises in Italy during January-October 1961, which totalled Lire 36,400 million. Among new investments planned for the Italian chemical industry, according to the Istituto Nazionale del Commercio Estero, the Italian Foreign Trade Board, are the following:

A Geneva-based company has expressed willingness to invest capital in a new plant to produce perchlorethylene, glycerine, etc. Another Swiss company has added about Lire 1,000 million to its investments in its Italian affiliates for the purpose of expanding two existing plants operating in the chemical-pharmaceutical sector.

An American company, based in St. Louis, is planning to invest some Lire 1,300 million in a Milan company to make possible the expansion of a chemical plant at Porto Marghera. A Boston, U.S., company plans to invest about Lire 250 million in the expansion of a chemical plant operated by a local company at Ravenna. Two companies, in Panama and St. Louis respectively, plan to invest some Lire 700 million in a chemical enterprise in Milan.

## German firms to build solvents plant for Egypt

Some 7 tonnes/day of solvents are to be produced biochemically at a new plant to be built in Egypt by the West German firms of Zahn und Co. GmbH, Berlin, and Ferrostaal AG, Essen. The order is said to be worth some £360,000. Base materials for the plant, which will produce compounds including butanol, acetone, butyl acetate and ethyl acetate, and such agricultural waste products as sugar-cane molasses and rice bran.

## U.S. firms cut prices of o-xylene

Pressure from Japan is the main reason for the fall in the price of o-xylene expected to take place early in the new year. Prices will be \$93 a tonne f.o.b. Houston, Tex., a drop of \$12 a tonne. Cosden, Cities Services, Delhi Taylor, Humble, Sinclair and Oronite all have export orders for Japan in 1962.

## New Mekog-Albatros fertiliser company to be set up

The talks that have been going on since February between Bataafse Petroleum Maatschappij N.V. (B.P.M.), The Hague, N.V. Koninklijke Nederlandsche Zoutindustrie (K.N.Z.), of Hengelo, and N.V. Koninklijke Nederlandsche Hoogovens on Staalfabrieken, IJmuiden, on the subject of co-operation in the field of fertiliser manufacture, resulted in the

decision to found a holding company in which these companies' fertiliser interests will be concentrated.

The new holding company—to be called Verenigde Kunststofabrieken Mekog/Albatros N.V.—will be the depository of all B.P.M.'s and Hoogovens' shares in N.V. Mekog (nitro-fertilisers) and all K.N.Z.'s shares in Albatros Superfosfaatfabrieken N.V. Mekog and Albatros will continue to exist as operating companies. B.P.M., K.N.Z. and Hoogovens will participate in the share capital of the new holding-company in the ratio of 40, 40 and 20%.

## Bulgarian chlor-alkali expansion

Expansion plans for the Karl Marx chemical combine in Devnya, Bulgaria, are announced by the Bulgarian Government. The new production units include facilities for chlorine in liquid and gaseous form for the plastics and paper industries, chloride of lime for the production of chlorine compounds, hydrogen, hydrochloric acid and caustic soda.

# Du Pont file trade secrets suit against Von Kohorn and German subsidiary

**DU PONT** and their Argentine affiliates, Ducilo, S.A.I.C., filed a suit on 4 December charging Von Kohorn International Corp., White Plains, New York, three of their principal officers and a German subsidiary company E.F.E.M. GmbH, Darmstadt, with unfair competition and misappropriation of trade secrets. Three former employees of du Pont or Ducilo are also named as co-conspirators.

The complaint states that the defendants have used or have offered to use Du Pont's secret process information in the design, construction and operation of plants for the production of cellulose film, nylon, polyester fibre, and polyester film in New York and other sites throughout the world, including U.S.S.R., Yugoslavia, Germany, Japan and Argentina. Du Pont and Ducilo seek a broad injunctive relief, an accounting of profits by the defendants, and damages of a 'large but presently unknown amount'.

Von Kohorn International and their subsidiaries design, build, operate and supply equipment for industrial plants, including plants for the manufacture of cellulose film, nylon, and polyester fibre

## Hercules Powder create research group for rocket fuel studies

Creation of a High Energy Research Division at the Hercules Powder Company's research centre, near Wilmington, Delaware, U.S., has been announced. The new group will undertake basic studies and applied research in support of Hercules' Chemical Propulsion Division, which is responsible for the production of solid propellant stages for the Minuteman, Polaris and Explorer series of space probes and other space projects.

## First plastics film plant for Allied Chemical

Arrangements to acquire a plant site near Pottsville, Pa., for their first commercial facility to produce plastics films have been announced by Allied Chemical International, New York. First products to be produced at the new site will be Aclar fluorohalocarbon and Capran polyamide films. Both are specialty films currently in pilot plant production. They are expected to be made available to world markets next year.

## Chemical by-products from Norwegian coking plant

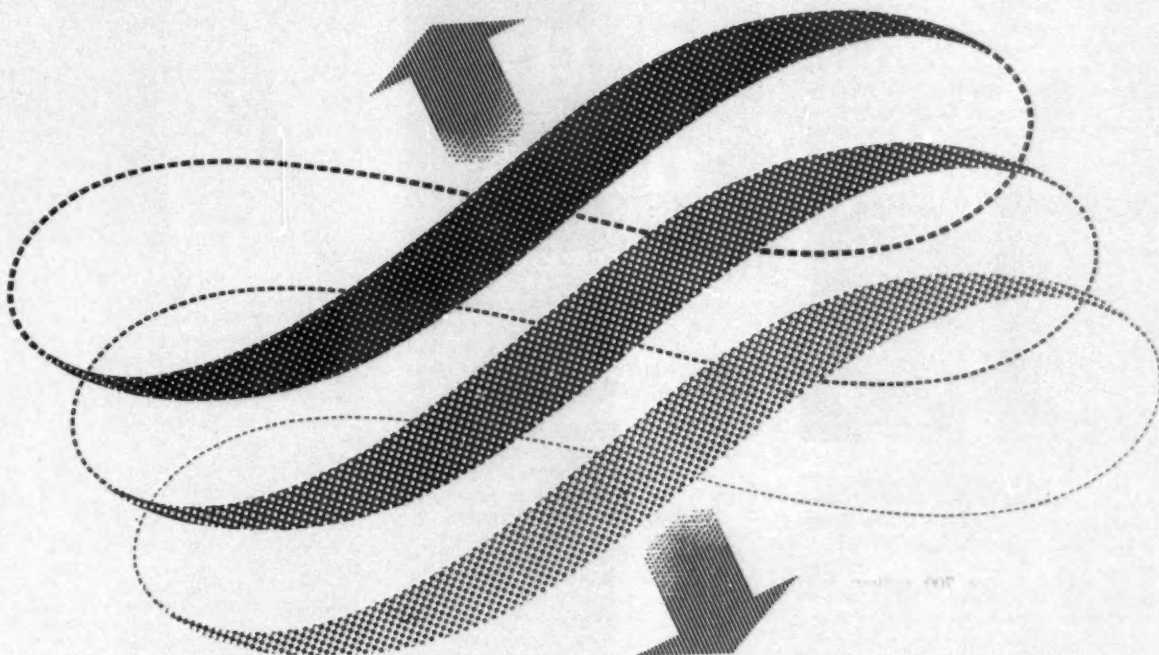
Ammonia, at present imported by Norway in large quantities, will be among the by-products of a £4 million coke oven plant to be built at Mo i Rana, Norway, for completion in 1963. The first plant in Norway expressly constructed for the production of metallurgical coke, the plant will also yield about 20,000 tons/year of tar and about 6,000 tons/year of benzole.

and film. Du Pont contend that, since 1954, the defendants have engaged in a conspiracy to acquire information of confidential manufacturing processes and special machinery and equipment used by Du Pont and Ducilo. According to Du Pont, eight or more of their employees were persuaded to accept employment with Von Kohorn or one of their associate companies at substantially increased salaries. They took with them drawings which they later handed over to Von Kohorn together with other confidential technical knowledge, including their continuous polymerisation process for polyesters.

As a result of these disclosures, Von Kohorn secured a contract for the design, construction and operation of a cellulose film plant in Argentina which competes directly with that of Ducilo. Also, Du Pont claim, the defendants applied for patents in various countries for devices substantially identical to those shown in the drawings taken by Du Pont employees.

Von Kohorn have denied the Du Pont charges and say they intend to reply to them in full.

## NEW from the world's largest separation engineering company



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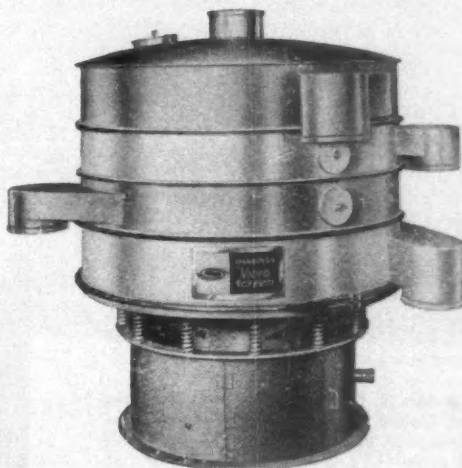
#### LIQUID-SOLID SEPARATION.

The Sharples-Kason gives liquid-solid separation and high volume dewatering on coarse and fine solids down to 325 mesh.

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Please tick relevant square or squares

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ADDRESS .....



● **Mr. C. D. W. Stafford** has been appointed chairman of the Beecham Pharmaceutical Division in the new re-organisation of the group's management structure by the creation of three divisional management companies. Others are Beecham Food and Drink Division (chairman, **Mr. A. E. V. Houschen**) and Beecham Toiletry Division (chairman, **Mr. A. C. Fabrisius**). Chairmen of these companies are executives directors of the Beecham Group. The divisional managements will be responsible for co-ordinating marketing policies and will direct product research work.



**P. J. Platt (left) and P. A. Gill, joint general managers of the newly formed Chemicals Division of the Pfizer Group (C.A., 2 December, p. 885)**

● **Mr. P. F. Corbett** (Shell-Mex and B.P. Ltd.), formerly hon. treasurer, was elected vice-chairman of the London Section, Royal Institute of Chemistry, at the recent annual meeting in succession to **Mr. A. J. Turnbull** (Nestlé Co. Ltd.). **Mr. A. N. Adamson** (British Aluminium Co. Ltd.) succeeded **Mr. Corbett** as hon. treasurer and **Mr. W. H. Bennett** (Overseas Geological Surveys) was appointed hon. secretary to succeed **Mr. G. C. Ackroyd** (Fire Office's Committee). **Dr. R. A. Jeffreys** (Kodak Ltd.) follows **Mr. Bennett** as hon. assistant secretary.

● **H. E. Redd**, chemical marketing representative for Gulf Oil Corporation in Houston, Texas, has been transferred to London, where he will co-ordinate Gulf's petrochemical marketing in Europe. He joined Gulf's petrochemical department in Pittsburgh in 1956 and in 1959 was transferred to Houston, where he has been responsible for petrochemical marketing in the lower south and south-west of the U.S.

● **Mr. H. E. Humphreys, Jr.**, chairman of United States Rubber, is resigning as chairman of the affiliated North British Rubber Co. Ltd., Edinburgh on 31 December. He will be succeeded by **Mr. George R. Vila**, president of U.S. Rubber.

● **Mr. W. K. Hutchison**, deputy chairman of the Gas Council and immediate past-president Institution of Chemical Engineers, has been elected president of the British Tar Confederation for 1961-62. Other officers elected are: hon. treasurer, **Mr. L. W. Blundell**, by-products controller, North Thames Gas Board; chairman of the executive board, **Mr. R. N. Bruce**, chairman, South

## PEOPLE in the news

Eastern Gas Board; vice-chairmen, **Mr. C. Lord**, chairman, Lancashire Tar Distillers Ltd. and **Lieut. Col. P. F. Benton-Jones**, managing director, United Coke and Chemicals Co.

● **Prof. Henry Eyring**, dean of the University of Utah Graduate School and one of the nation's foremost theoretical chemists, has been chosen president-elect of the American Chemical Society. He will head the 93,000-member Society in 1963. A.C.S. president for 1962 will be **Dr. Karl Folkers**, executive director of fundamental research of the Merck Sharp and Dohme Research Laboratories, Rahway, N.J., who takes office on 1 January, succeeding **Prof. Arthur C. Cope**, head of the chemistry department in the Massachusetts Institute of Technology.

● **Mr. Arnold Carr**, deputy chairman and assistant managing director of Thos. W. Ward Ltd., Albion Works, Sheffield, has been appointed joint managing director.

● **Mr. Frank Kenyon**, a senior director of the William Kenyon group of companies, was elected chairman of the Federation of European Petroleum Equipment Manufacturers at its recent



**Mr. P. D. O'Brien (left), chairman of Laporte Industries Ltd., makes a presentation to Mr. V. W. Slater, a director of the company, who has retired after 41 years' service to the Laporte Group (see C.A., 9 December, p. 929)**

annual general meeting in Marseilles. British membership is exercised by the Council of British Manufacturers of Petroleum Equipment, in whose work **Mr. Kenyon** has also been prominent for many years.



**P. C. Allen**

● **Mr. P. C. Allen** will relinquish his appointment as president of the I.C.I. subsidiary, Canadian Industries Ltd., on 1 March, 1962, and will return to this country to resume his duties as an executive director of Imperial Chemical Industries Ltd. He will become overseas director responsible for Western Europe. **Mr. Allen** will remain on the board of C-I-L as non-executive chairman. **Mr. L. Hynes** has been appointed president, and chairman of the executive committee, of Canadian Industries Ltd. **Mr. W. T. D. Ross** has been appointed vice-chairman of the executive committee. Both appointments are from 1 March next.



**Dr. W. A. Johnson of Pure Chemicals Ltd., Kirkby (left) with H. S. Proctor, general manager of Colin Campbell Mixers Ltd., at the recent annual dinner in Manchester of the Colin Campbell Group of engineering companies. The group comprises Process Plant Designers and Contractors Ltd. and Colin Campbell Mixers**

● **Mr. W. L. Nicol**, formerly deputy production and technique manager at Scottish Agricultural Industries Ltd., has been appointed works manager at Aberdeen, where he will be responsible for the Sandilands chemical works and the Dyce fertiliser works. He succeeds **Mr. H. B. Hill** who is retiring from the Aberdeen works after 50 years with S.A.I.

● **Mr. R. W. Bailey** has joined K.D.G. Instruments Ltd., Crawley, Sussex, as assistant chief designer of the pressure element department (see also 'Trade Notes', p. 978). He previously held the position of chief development engineer of the diaphragm and capsule section at Kelvin and Hughes Ltd. from 1955.



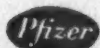
It's a winning hand!

Lead with the ace—Lithium Hypochlorite—ideally suited for formulation in household and commercial dry bleaches for washing and sterilising compounds. For any problem requiring a solid bleach, Pfizer Lithium Hypochlorite should be examined.

### Pfizer Lithium compounds available include

LITHIUM AMIDE	LITHIUM CHLORIDE
LITHIUM HYDRIDE	LITHIUM HYDROXIDE
LITHIUM BROMIDE	LITHIUM NITRATE
LITHIUM CARBONATE	LITHIUM SULPHATE
BUTYLLITHIUM (normal or secondary)	LITHIUM METAL—rod, sheet, wire, dispersions, etc.

Technical Service and Information from:—



**CHEMICALS** Pfizer Ltd., Chemical Sales Division, Sandwich, Kent  
Sandwich 2371 Advance (London) 1234 (inter-connected)

CH48/17013



## Commercial News

### British Tar

British Tar Products are halving their interim to 2½% for the year to 31 March 1962. The previous final was 10%.

The directors state that results during the first half of the year have been distinctly disappointing but, nevertheless, in line with those of the leaders in the chemical industry. However, there are now signs of recovery discernible which give grounds for the belief that "the worst is past".

### D.C.L.

The Distillers Co. Ltd. report that trading profit of the Group for the half year ended 30 September 1961, after charging depreciation, is £16,125,000 compared with £15,922,000 for the corresponding period last year. Income from trade investments amounted to £610,000 (£556,000) and, after charging interest on debenture and loan stocks £287,000 (£315,000) and eliminating the interests of outside shareholders £89,000 (£232,000), the net profit before taxation attributable to the company is £16,359,000, compared with £15,931,000.

The rate of profits tax was increased from 12½% to 15% as from 1 April 1961. Consequently, the net profit after taxation is practically the same as last year.

In conformity with the indication given by the chairman in his last statement to shareholders, the board have declared an interim dividend on the ordinary capital for the year ending 31 March 1962 of 6% (5% equivalent) less income tax at the rate of 7s 9d per £, payable on 28 February 1962 to shareholders on the Register at 6 December 1961.

Overseas competition affects Industrial Group profit margin—see page 958.

### Fisons Horticulture

Business and goodwill of Clay and Son Ltd., manufacturers of garden fertilisers, is acquired by Fisons Horticulture Ltd. under a sale agreement concluded with Clay's shareholders. Clay, who have a plant at Harlow, Essex, are one of the U.K.'s oldest fertiliser manufacturers, having been established in 1864.

The managing director of Fisons Horticulture Ltd., Mr. F. J. Heath, and co-director Mr. P. M. A. Packard, have joined the board of Clay and Son—Mr. Heath as chairman.

Fisons Horticulture Ltd., a subsidiary of Fisons Fertilizers Ltd., are the largest manufacturers of gardening products in Europe and enjoy a substantial share of this booming market. They are equally active in commercial horticulture and are well established in overseas markets, particularly Europe. A recent acquisition of the company is the Eclipse Peat Co., while Liquinure Sales Ltd. are also a subsidiary.

### Morgan Crucible

Morgan Crucible have made an offer to acquire the balance of £246,192 of the

- D.C.L. pre-tax profit up by £400,000
- Fisons Group acquires Clay and Son
- S.A.I. report lower sales and profits
- Du Pont expect to top record sales

6% cumulative preference stock of Ship Carbon Co. of Great Britain. The suggested terms are six 5% cumulative second £1 preference shares for every five 6% preference held. The directors of Ship Carbon are recommending acceptance.

### Glaxo

Sales of Glaxo Laboratories Ltd. are up on last year and the increase is being steadily maintained, Sir Harry Jephcott, chairman, stated at the annual general meeting on 11 December.

### S.A.I.

Consolidated profit of Scottish Agricultural Industries Ltd. for the year ended 30 September totalled £1,311,322 (£1,499,216) after depreciation of £600,955 (£609,281). Net profit after tax was £664,575 (£688,382), of which £13,864 (£10,599) was applicable to minority interests. Sales of S.A.I., who are controlled by I.C.I., totalled £24,404,584 (£24,834,744), showed a recovery from the first eight months when they were £1.4 million less than in the same period a year ago. A final dividend of 8% is declared making 12% (same).

### Staveley Industries

Referring to the chemical interest of Staveley Industries Ltd., Mr. J. P. Hunt, chairman, in his annual statement said that a small loss was incurred by Amasal Ltd., but that future operations should be profitable following further reorganisation and integration. Beswick's Lime Works Ltd. maintained a high level of production with profits comparable with a year ago.

Turnover of the Birmingham Chemical Co. Ltd. rose, particularly in aromatic and other chemicals. Because of the manufacturing arrangement with Amasal profits were higher. Production of salt by the British Soda Co. Ltd. rose following purchase of the works of Palmer Mann and Co. Ltd. and profits have been satisfactory despite the chemical industry's reduced demands for salt.

Turnover of R. D. Nicol and Co. Ltd. again rose, but high costs had resulted in a slight reduction of profits. Modernisation of works and laboratory equipment were in hand.

### Borden Co.

Borden Co., U.S., report for the third 1961 quarter, as compared with the corresponding period of last year, a net profit of \$8,170,000 (\$7,580,000) or 77 (73) cents/share after a quarterly turnover of \$257 million (\$249 million) and tax payments

of \$7.8 million (\$6.5 million). For the whole first three-quarters of 1961, Borden net profit has amounted to \$22.9 million (\$21.9 million) or \$2.16 (\$2.10)/share of the slightly increased capital, after turnover had risen from \$739 million to \$759 million and tax payments from \$20.3 million to \$22 million.

### Du Pont

Sales in October of E.I. du Pont de Nemours reached the record level of \$198 million (\$184 million) and it is estimated that total 1961 sales will be about 2% higher than the 1960 record of \$2,143 million.

### B. F. Goodrich

For the first nine months of 1961, earnings of B.F. Goodrich were worth \$2.52/share (\$2.68), with third quarter earnings nearly 35% up on the comparable 1960 figure.

### Goulding

Commitments of W. and H. M. Goulding Ltd., Dublin, for capital expenditure at 30 June totalled £80,000 (£360,000). Sales of superphosphate increased slightly but sales of compounds showed marked increases, said Sir Basil Goulding at the recent annual meeting. The general level of phosphate usage was still far from satisfactory; according to the Department of Agriculture, Eire's usage should be more than 1 million tons a year, which is equivalent to 2½ times the present usage of phosphorus.

### Nopco Chemical Canada

Nopco Chemical Canada Ltd., specialty producers, have purchased Canadian Aniline and Extract Co. Ltd., of Hamilton, Ontario. Sum involved was not revealed.

### Reichhold-Chemie AG

Reichhold-Chemie AG, Hamburg, expect an annual turnover of DM 48-50 million over the current year. Over the first 1961 half-year turnover was 12% above that for the corresponding 1960 period. The company announces a slowdown in rate of increase and cuts in profits over the year.

### Stickstoffwerke

Net profit of Österreichische Stickstoffwerke AG, Vienna, was Sch.18 million (Sch.17 million). Dividend is 3% (same).

### INCREASES OF CAPITAL

A/S BORREGAARD, Norway. Capital is to be increased from Kr.100 million to Kr.135 million.

(continued on page 976)



## COLT create the right climate in

On the upper working levels especially—with half of the reactor and steam pipes below him—a man needs fresh air to be comfortable.

The first summer's operation of their No. 1 Polyethylene Pilot Plant at Carrington, brought this home to Shell Chemical Co. Ltd. So they called in Colt to improve conditions.

One result of the Colt installation of a system of air inflow units and natural extractors was a repeat order! A similar system has now been installed in the recently completed No. 2 Pilot Plant.

Similar Colt systems are at work in every branch of the Chemical industry, eliminating conditions that make efficient, contented work difficult, or even impossible.

Colt's practical experience of the ventilating problems that arise in Chemical Manufacture and Processing could prove useful to you.

Ask your Secretary to write to the Information Officer for a free Manual of Colt Systems and Equipment.



Four of the eight Colt filtered air inflow units in the No. 2 Pilot Plant at the Carrington Research Laboratories of Shell Chemical Company Ltd., nr. Manchester.

# COLT

industrial ventilation

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## 200 chemical works

Albright and Wilson (Manufacturing) Ltd.

Allen and Hanbury's Ltd.

Aspro-Nicholas Ltd.

Bakelite Ltd.

F. W. Berk and Co. Ltd.

J. Bibby and Sons Ltd.

Boots Pure Drug Co. Ltd.

Bowmans Chemical Ltd.

British Glues and Chemicals Ltd.

British Geon Ltd.

British Hydrocarbon Chemicals Ltd.

British Oxygen Co. Ltd.

British Resin Products Ltd.

British Titan Products Co. Ltd.

W. J. Bush and Co. Ltd.

B. X. Plastics Ltd.

Costes Bros. and Co. Ltd.

Courtaulds Ltd.

Cyanamid of Great Britain Ltd.

Distillers Co. Ltd.

Distillers Co. (Biochemicals) Ltd.

Alexander Duckham and Co. Ltd.

Esso Petroleum Co. Ltd.

Evans Medical Ltd.

Fisons Ltd.

Forth Chemicals Ltd.

Glaxo Laboratories Ltd.

I.C.I. Ltd.

Laporte Industries Ltd.

Monsanto Chemicals Ltd.

Metal Box Co. Ltd.

Pinchin, Johnson and Associates Ltd.

Reckitt and Colman Ltd.

Shell Chemical Co. Ltd.

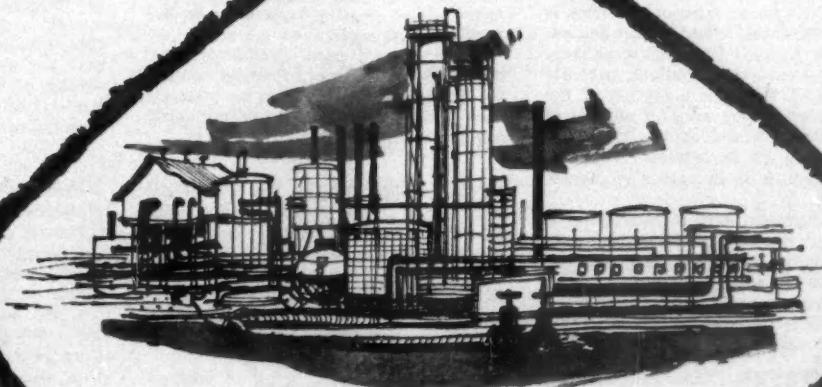
Smith and Walton Ltd.

Stewarts and Lloyds Plastics Ltd.

Unilever Ltd.

Vulcanite Ltd.

Yardley and Co.



## Increased capital for B.D.H., Uclaf and joint U.S.-Ugine company *(cont'd. from p. 974)*

**BRITISH DRUG HOUSES LTD.** Increased by £775,000 beyond the registered capital of £2,750,000.

**DUNSTAN HILL CHEMICALS LTD.**, 10/11 St. Dunstons Lane, London E.C.3. Increased by £2,400 beyond the registered capital of £1,000.

**ORTHO PHARMACEUTICAL LTD.**, Saunderton, High Wycombe, Bucks. Increased by £40,000 beyond the registered capital of £200,000.

**SOC. EUROPÉENNE DE BORE**, the French company formed earlier this year by Ugine, and American Potash and Chemical, for the future production of boric acid in France, are to increase capital from Fr.1 million to Fr.3 million. Some Fr.10 million are needed for investment in the planned acid production unit.

**TITANSELSSCHAFT MBH**, Leverkusen, West Germany, producers of titanium dioxide and pigments, have raised their capital from DM 50 million to DM 60 million. The extra shares will be held by the company's 100% owner, National Lead Co., New York.

**USINES CHIMIQUES DES LABORATOIRES FRANÇAIS S.A.** (Uclaf), France. Capital increased from Fr.35 million to Fr.97,250,000 following the taking-over of activities of certain other French pharmaceutical companies.

### NEW COMPANIES

**CARROL AND DENFIELD LTD.** Cap. £100. Importers, exporters, agents, factors,

merchants, distributors or manufacturers of chemicals, etc. Directors: A. Carroll and I. Denfield. Reg. office: 70 Woodlands, London N.W.11.

**CHEMICAL STORAGE LTD.** Cap. £100. To construct, equip and maintain tanks, drums, hoppers, vats, cases and other receptacles for the storage of chemicals, oils and raw materials of all kinds in bulk, etc. Directors: W. M. Pybus, A. R. Jabez-Smith. Reg. office: Room 150, 20 Cophall Avenue, London E.C.2.

**KOCH LABORATORIES LTD.** Cap. £100. To develop, market and exploit chemical engineering and other scientific processes; manufacturers of and dealers in chemicals, ferrous and non-ferrous products requiring the admixture of synthetic rubbers, polymers and chemical materials, etc. Directors: P. B. Koch and Mrs. S. Koch. Reg. office: 32 Britton Street, Clerkenwell Road, London E.C.1.

**PRESERVITA LTD.** Cap. £10,000. Chemists, chemical and general engineers, druggists, oil and colour men, etc. Solicitors: Alexander Rubers and Co., 73 Basinghall Street, London E.C.2.

**REGENT REFINING CO. LTD.** Cap. £1,000. Refiners, petrochemists, etc. Solicitors: Lovell White and King, 1 Serjeants Inn, London E.C.4.

**YORKSHIRE DYEWARE AND CHEMICAL CO. (EXPORT) LTD.** Cap. £1,000. Directors: F. F. Helme, H. Wiles, L. L. Bedford, K. K. Fourness and G. Fontany. Reg. office: Black Bull Street, Leeds.

## Plutonium fuel and nuclear power

THE substantial progress made in recent years towards the efficient use of plutonium as an economic and reliable source of heat for nuclear power stations will be reviewed in 'Plutonium fuel and nuclear power'. This is a paper that is to be given by L. Grainger and A. B. McIntosh at the first meeting of the British Nuclear Energy Society to be held at 1-7 Great George Street, London S.W.1, on 31 January at 5.30 p.m.

During the past 10 years, plutonium fuel technology has been developed within the Atomic Energy Authority and a range of production, fabrication and processing techniques are now in advanced stages of investigation. The technology covers a wide variety of plutonium fuels and takes account of their application in various reactor systems.

The Society has been established as a successor to the British Nuclear Energy Conference. It has the full support of the Institution of Chemical Engineers, a founder member of the former organisation. Membership is open to individuals actively engaged in the professional, scientific or technical aspects of the application of nuclear energy engineering.

## Major U.S. aerosol prize for British firm

FOR the second time, a premier award of the American Chemical Specialties Manufacturers' Association has gone to a British firm for aerosol design. This time the recipients of the award are the Grimsby manufacturing chemists, Osmond and Sons Ltd., who have won a first-class award in the A.C.S.M. annual aerosol package design contest. The award-winning aerosol was for a veterinary product.

This was the first time that Osmond and Sons have participated in the contest, although they are now one of Britain's biggest exporters of aerosol sprays and have 40 different lines under current production. Osmond started manufacturing aerosols four years ago and are one of the few firms in the industry who designed their own plant and equipment.

In the U.S. contest last year, the grand prize for the best-designed spray package of 1960 went to Sprayclean Spot Remover, a product of Durazone (Sales) Ltd., London. This year, Durazone won the top awards for the best-designed aerosol packs in two sections of the contest—'Horticultural products' and 'Other personal products'.

## Noyes guide to U.S. chemical industry

Newly published by the Noyes Development Corporation, 38 East 57th Street, New York 22, is the 'Chemical Guide to the United States, 1962' (price 15s. \$15 post paid). This guide describes the activities of the 150 largest chemical firms in the U.S. Each company is listed with details of address, directors, 1960 sales, divisions, products, U.S. and foreign subsidiary and affiliated companies, etc.

## Market Reports

### MODERATE CALL FOR COPPER SULPHATE

**LONDON** In the market for industrial chemicals there has been a fairly active movement on home account and there has also been a steady flow of overseas inquiry. Contract replacement business is receiving increasing attention but any expansion of forward bookings is unlikely until the general trade outlook becomes less unsettled. With the exception of the recent decline in the price of citric acid prices have continued at late rates and the undertone of the market is steady. Copper sulphate is in moderate request at £78/ton.

The movement into consumption of the coal tar products generally is mostly against contracts and the next week or two should see some activity in renewal business covering the early months of 1962. Pitch is in good request on home and export account.

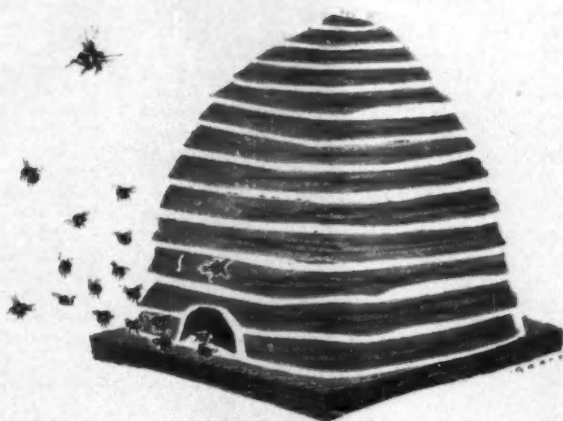
**MANCHESTER** There has been a fair movement of contract supplies but from the point of view of fresh business the

approach of the year's end has been reflected in somewhat quieter conditions, which are expected to continue until after the turn of the year. The shipping movement against existing commitments has been on a fair scale.

For the most part, quotations have been well maintained. Leading outlets for the light and heavy coal tar products have been calling for reasonably good supplies.

**SCOTLAND** Buying for the Home Market has shown little alteration, with the tendency, if anything, to be quieter. Movement has mostly been for the usual routine range of industrial chemicals with little change in quantities. Delivery is still an important factor and with the prevailing weather conditions some difficulties have been presented.

Interest is still very active in contract enquiries for 1962. Prices generally have been steady this past week.



**IT'S A SMALL WORLD  
AND MARCHON SURFACTANTS PLAY A BIG PART IN IT**

Marchon is a hive of industry too and produces essential detergent chemicals such as, for example, NANSAL HS FLAKE, a highly concentrated dodecyl benzene sodium sulphonate which is used as a raw material for industrial and domestic detergents by manufacturers all over the world. And this is not to mention all the other Marchon detergent raw materials which are relied on wherever detergents are made. Why not write for data, samples or advice?





## TRADE NOTES

### Insulating film

Five new grades of Du Pont Mylar film are now available from the U.K. distributors, Durham Raw Materials Ltd., 1/4 Great Tower Street, London E.C.3. They are characterised by greatly increased strength in the machine direction, and can therefore be used in applications which were impossible in the past, or, alternatively, thinner gauges can be used. Main applications are in the electrical and electronic fields.

### Phosphating process

A new process, Fospryme, is claimed to meet the needs of industry for a simple but effective method of phosphating steel—either before fabrication, which gives a temporary protection against corrosion, or before final finish. The process, which does not require any heating or complicated plant, operates at room temperatures and may be applied to the degreased material by spray gun, brush or roller, or by a simple dipping operation, dependent on the specified requirements of the particular job. A number of other advantages are claimed.

Details are available from the Phosphate Protection Division of Hellermann Ltd., Gatwick Road, Crawley, Sussex.

### K.W. Chemicals agents

K.W. Chemicals Ltd., Caroline House, 55-57 High Holborn, London W.C.1, have appointed F. W. West (Chemicals) Ltd., of Mount Pleasant Laboratories, Ilkley, Yorks, under the direction of Mr. F. W. West as their northern agent for Yorkshire, Lancashire, Cheshire, Derbyshire, Co. Durham, Northumberland, Cumberland and Westmorland.

### Melamine formaldehyde resins

Use of melamine formaldehyde resins for laminates and adhesives is described in a revised technical bulletin, No. 2, issued by British Oxygen Chemicals Ltd., 24 Grafton Street, London W.1, who manufacture melamine. Three methods of preparation of melamine/formaldehyde resin syrups are given and there are also sections on the preparation of both decorative and industrial glasscloth laminates, and on the application and properties of these laminates, with, finally, a discussion of melamine resin adhesives.

### Pressure elements

All types of diaphragms, capsules and pressure elements, in large or small quantities, in various sizes and thicknesses and in such materials as stainless steel, beryllium copper and phosphor bronze can now be designed and manufactured by K.D.G. Instruments Ltd., Manor Royal, Crawley, Sussex.

As mentioned in 'People in the News' (p. 972) Mr. R. W. Bailey has now joined the company as assistant chief designer of the pressure element department, where he will be associated with Mr. L. A. Armstrong, who joined the com-

pany two years ago as chief designer of pressure responsive elements. This combination will enable the department to be expanded adequately to meet outside demands, as opposed to the company's previous policy of producing diaphragms, capsules and pressure elements purely for use with their own range of pressure indicating and control instruments.

### LPG plant

Liquefied petroleum gas plant is introduced and described in a new illustrated publication, No. 89, from W. C. Holmes and Co. Ltd., P.O. Box B7, Turnbridge, Huddersfield. Design features of Holmes installations are explained and there is also a brief discussion of the advantages of the dilution of butane vapour by air.

### Polythene fittings

Kay and Co. (Engineers) Limited of Bolton, who are members of the Alenco Group of Companies, have just published a catalogue covering the very wide range of types and sizes of fittings required by the user of polythene tube for installations of all kinds.

A catalogue of fittings for polythene tube installations comes from Kay and Co. (Engineers) Ltd., Blackhorse Street, Bolton, Lancs. The catalogue covers the full range of tube sizes likely to be required, together with their corresponding fitting and liner sizes. All fittings are

manufactured in gunmetal as proof against dezincification.

Kontite fittings are now manufactured to suit exactly the outside diameter of the polythene tube and liners are employed which are a push fit into the bore of the tube.

### Skydrol rubbers

The publication entitled 'Skydrol resistant rubbers' issued by Precision Rubbers Ltd., Bagworth, Leicester is now in its second edition. It deals with an entirely new range of compounds which will in the future be known under the name of Prescothene. These compounds were developed for good wear, low compression set and temperature resistance up to 150°C.

### Jet fuel additive

Dow Chemical Company (U.K.) Ltd., 48 Charles Street, London W.1, are to market in Great Britain a new anti-icing additive for jet fuel. Use of this additive, PFA 55 MB, has been patented by Phillips Petroleum Co., U.S., who have licensed the Dow Chemical Co.—American parent of the U.K. company—to manufacture and sell it.

The additive, which is soluble in both fuel and water, prevents in-flight ice formation in jet fuel. It has been approved by U.S. Air Force for use by the Strategic Air Command and application has been made to the Federal Aviation Agency for approval in fuels for commercial jets and turbine-powered aircraft.

## Rail tankers use compressed air for dustless discharge of powders

RAIL transportation of powdered chemical and fertiliser products in bulk in closed vessels, discharge being by fluidising the powder using compressed air, seems to be finding increasing favour in the Netherlands. N.V. Machinenfabriek Frans Smulders, who make rail tankers for this purpose, and who have recently been incorporated in V.M.F. as an affiliated company of Stork Hengelo, report that so far 180 rail tankers have been supplied to Netherlands Railways. Transportation and discharge of powdered products in this way overcomes the dust nuisance.

Two spherical tanks are mounted on the cars, each having a capacity of 22.4 cu. yd., in which the powdered material is loaded in bulk. To discharge the powder, air is pumped into the tanks by a compressor, whereby the fluidised state is obtained and the whole contents of the sphere are subjected to pressure.

The discharging operation, beginning with the opening of the valve in the discharge line, takes about 15 min. This equals a rate of about 1,400 cwt. bags per hour or 23 bags/min. Another great advantage is that the product can be transported via pipelines straight to the desired storage place.

The spheres have an outside diameter

of 3.15 m. (10.3 ft.) and are designed for a working pressure of 40 p.s.i. The wall is of welded construction and made of 5/32 in. thick plate material. A funnel for discharging is provided at the bottom of the tank.

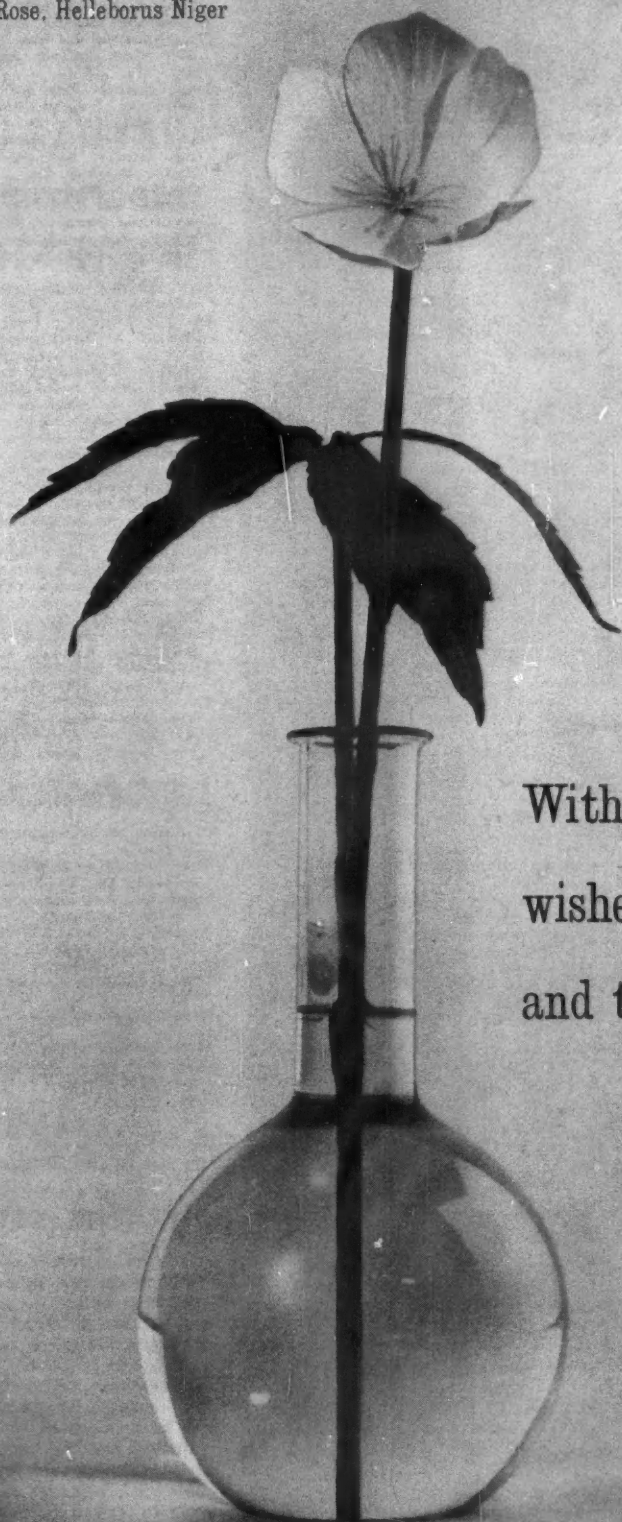
### Precautions for users of ionising radiations

No. 13 in the Ministry of Labour Safety, Health and Welfare series of booklets deals with ionising radiations and precautions for industrial users. The booklet is concerned only with risks associated with the use of X-rays and sealed radioactive sources, although risks associated with the use of unsealed sources are mentioned where appropriate. The booklet is available from H.M.S.O. at 2s 6d.

### Elga annual photographic competition

Entries for the annual photographic competition with the theme 'The Elgastat in action' organised by Elga Products Ltd., Lane End, Bucks, can be accepted until 15 January 1962. The entries should be black and white on glossy paper, 8½ in. by 6½ in. Prizes amounting to £125 and a challenge cup will be awarded.

Christmas Rose, *Helleborus Niger*



With sincere good  
wishes for Christmas  
and the New Year

THE DISTILLERS COMPANY LIMITED    CHEMICAL DIVISION  
Devonshire House Mayfair Place Piccadilly London W1



# NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2., price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

## ACCEPTANCES

### Open to public inspection 17 January

Manufacture of silver azide. Supply, Minister of. 887 141  
Production of gas from oil. Woodall-Duckham Construction Co. Ltd. 887 203  
Antioxidants for rubber articles. Dunlop Rubber Co. Ltd. 887 174  
Polymers. Imperial Chemical Industries Ltd. 887 175  
Polymeric materials. Imperial Chemical Industries Ltd. 887 176  
Manufacture of synthetic resin emulsions. Vinyl Products Ltd. 887 356  
Chromium complexes of monoazo dyestuffs, derived from thionaphthene and their uses. Compagnie Francaise des Matieres Colorantes. 887 179  
Polymerisation catalysts. Imperial Chemical Industries Ltd. 887 313  
Polyquaternary ammonium compounds. Farbenfabriken Bayer AG. 887 358  
Process for preparing dihydrodesoxystreptomycin. Yabuta, T., Ikeda, H., Shiroyanagi, K., Ikeda, H., Fujimaki, I., Katayama, M., Tsuji, K. I., and Sato, T. 887 597  
Preparation of carboxylic acids. Pechiney. 887 385  
Polymerisation catalysts. Imperial Chemical Industries Ltd. 887 314  
Metallising azoic dyeings. General Aniline & Film Corp. 887 386  
Heat-stable organosiloxane compositions of grease-like consistency. Wacker-Chemie GmbH. 887 486  
Process for the production of cross-linked polyvinyl chloride. Saint-Gobain. 887 449  
Silicone elastomers. Union Carbide Corp. 887 441  
Isocyanate-extended polyoxyalkylene-carboxyalkylene polymers. Union Carbide Corp. 887 180  
Tetrahydro-dioxypyridazines and process for their preparation. Ciba Ltd. 887 318  
Production of hydrogen-free penicillins. Riker Laboratories Inc. 887 408  
Heat-resistant powders. Linde's Eismaschinen AG, Ges. 887 147  
Preparation of  $\beta$ , $\beta$ -disubstituted- $\beta$ -cyanoketones. Rohm & Hass Co. 887 411  
 $\beta$ , $\beta$ -Disubstituted- $\beta$ -cyanoketones. Rohm & Hass Co. [Addition to 887 411.] 887 412  
Carbo-cyclic cyanoketones. Rohm & Hass. [Addition to 887 411.] 887 413  
Phenothiazine derivatives. Rhone-Poulenc. 887 585  
Treatment of polymers. Imperial Chemical Industries Ltd. 887 315  
Process for the recovery of di-sec-butyl ether. Rheinpreussen Aktiengesellschaft fuer Bergbau und Chemie. 887 300  
Preparation of polypeptides. Uclaf. 887 415  
Para-amino-monoazo dyestuffs and their preparation and use. Badische Anilin- & Soda-Fabrik AG. 887 416  
Therapeutic compositions comprising novobiocin. Upjohn Co. [Addition to 815 518.] 887 393  
Sulphonyl-ureas and a process for preparing them. Farbwerke Hoechst AG. 887 359  
Process for reclaiming oxine flotation reagent from products of flotation. Last, A. W., and Marquardson, K. F. 887 469  
Process for making derivatives of hydroxymethyl furfural. Merck & Co. Inc. 887 369  
Hydrocarbon wax compositions having mechanical properties. Farbwerke Hoechst AG. 887 417  
Treatment of polyesters. Imperial Chemical Industries Ltd. 887 316

Method of dimerising lower alpha-olefins. Montecatini. 887 395  
Process for stabilising concentrated polyhydric alcohol solutions. Udic S.A. 887 396  
Radiochemical sulphonation reaction. Esso Research & Engineering Co. 887 049  
Production of alkenes. British Petroleum Co. Ltd., White, P. T., and Porter, F. W. B. 887 307  
Polymerisation of unsaturated compounds. Consortium für Electrochemische Industrie GmbH. 887 362  
Manufacture of hydrogen peroxide. F.M.C. Corp. 887 364  
Vinyl pyrazoles and polymerisation product thereof. British Oxygen Co. Ltd. 887 365  
Dihydrodesoxystreptomycins. Rikagaku Kenkyuho. 887 598  
Reactive dyestuffs. Farbenfabriken Bayer AG. 887 598  
Edible fatty acid glycol ester compositions. Drew & Co. Inc., E. F. 887 418  
Pesticidal composition. American Cyanamid Co. 887 308  
Sulphurised or phosphosulphurised detergent-inhibitor oil additive. Esso Research & Engineering Co. [Addition to 788 408.] 887 334  
Aminoaryl esters and amides of phosphoric and thiophosphoric acids. Farbenfabriken Bayer AG. 887 335  
Benzo-bis-imidazoles and process for their manufacture. Ciba Ltd. 887 337  
Sulphur dioxide absorption. Bergwerksverband GmbH. 887 368  
Hardenable compositions comprising epoxide compounds and boron trifluoride. Ciba Ltd. 887 529  
Nitrogenous epoxide compounds and process for their manufacture. Ciba Ltd. 887 589  
Dimerisation of monoolefins. Esso Research & Engineering Co. 887 590  
Anion-exchange resins. Farbenfabriken Bayer AG. 887 338  
Organo boron compounds. Purdue Research Foundation. 887 370  
Steroids and the manufacture thereof. Upjohn Co. 887 080  
Process for the manufacture of quinacridones from 6:13-dihydroquinacridones. Ciba Ltd. 887 373  
Pesticidal compositions. Imperial Chemical Industries Ltd. 887 342  
Epoxy-substituted bicyclic acetals and a process for their preparation. Union Carbide Corp. 887 593  
Synthetic ester lubricants. British Petroleum Co. Ltd., Dean, R. A., and Gould, P. 887 343  
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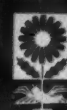
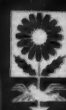
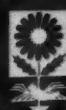
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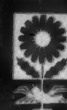
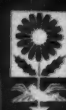
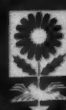
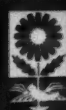
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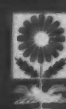
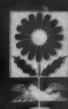
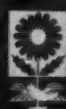
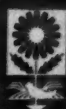


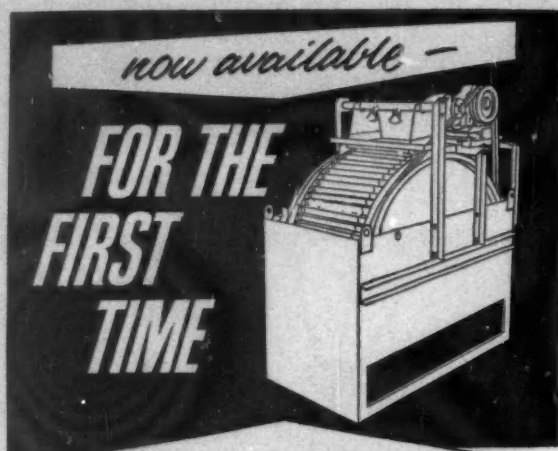
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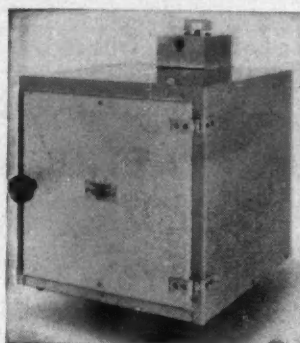
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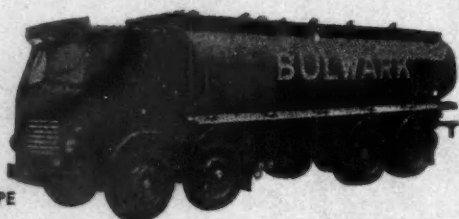
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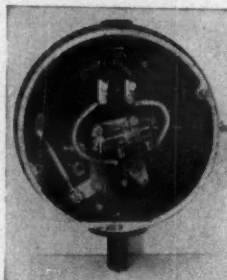


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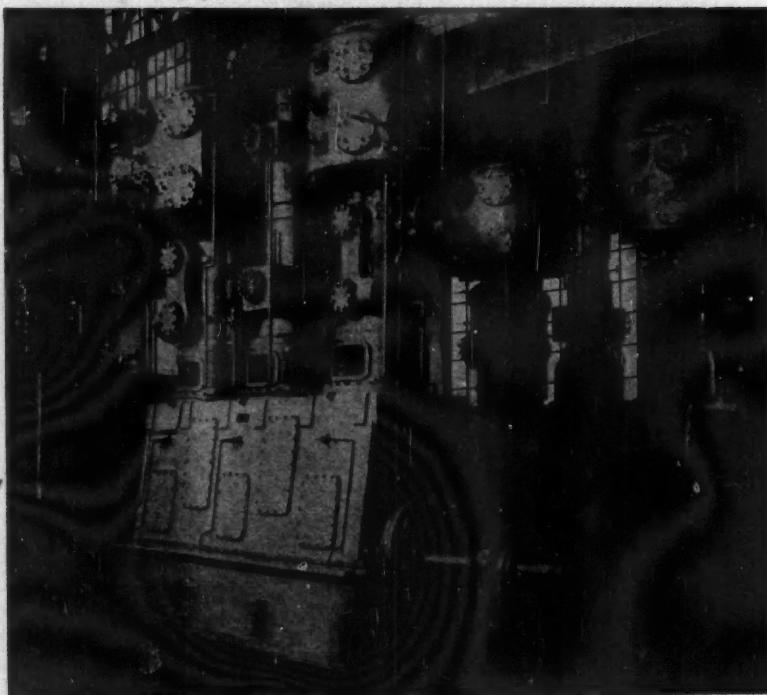
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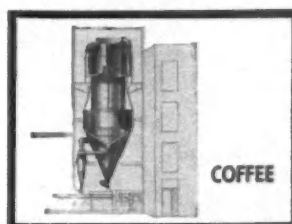
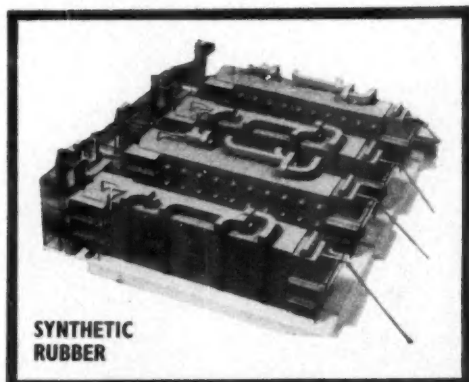
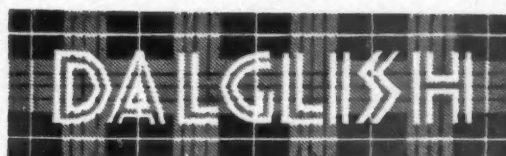
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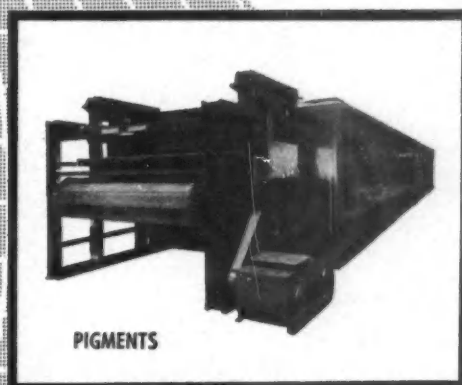
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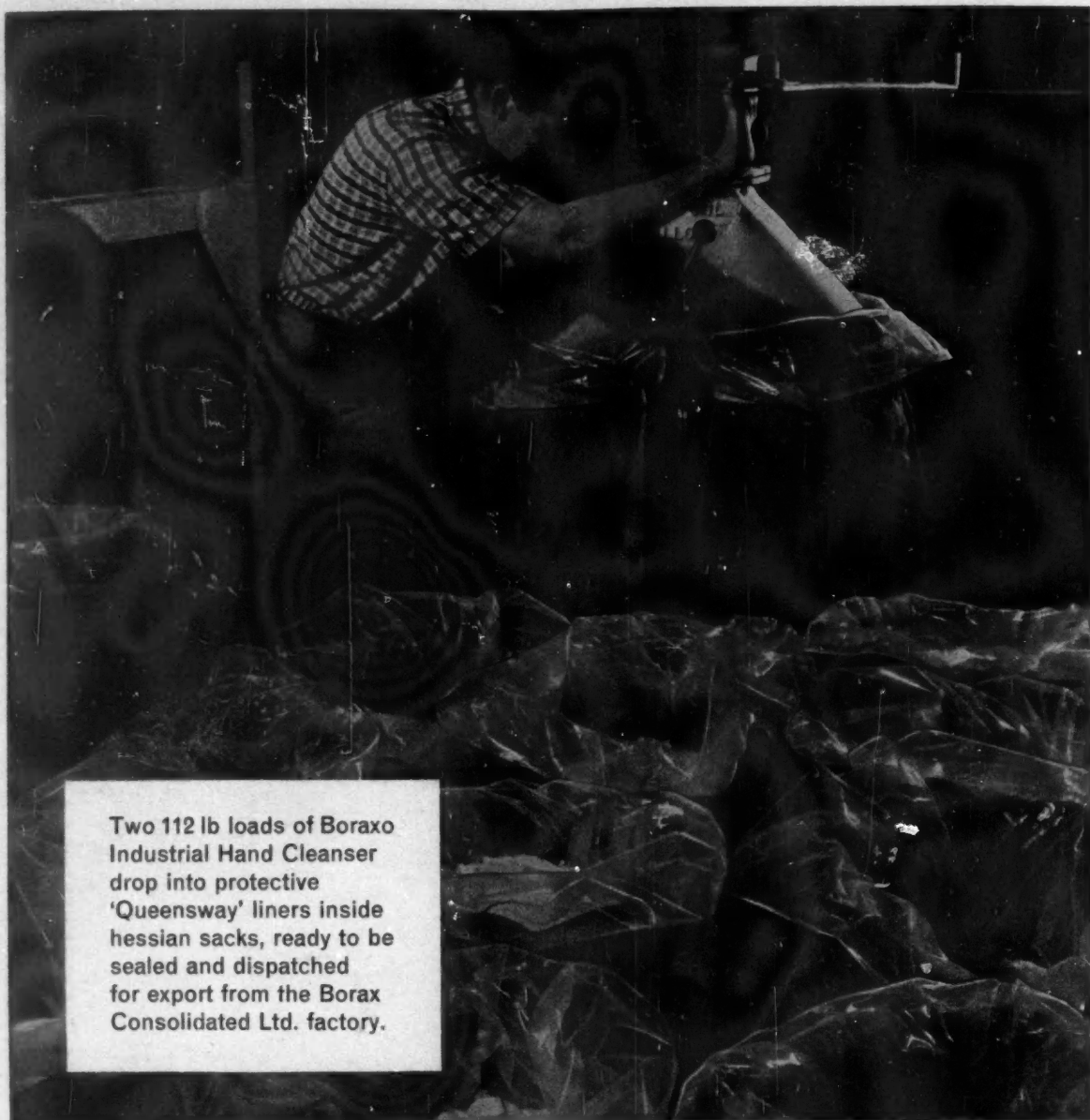
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